Auto Diagnostic Computer Equipment

【USER'S MANUAL】

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FCAR F3 Series Product Operation Manual Instruction

- Before using FCAR F3 series product, please read this manual carefully.
- This manual is based on the current product features and configurations. If adding new features and configuration, this manual will subsequently be amended, the new specification can be download at FCAR website (http://www. fcar.com).
- Please carefully read the "Note" " remark " of the user manual to ensure that the user can use properly and safely.
-

FCAR F3 Series Main Unit Maintenance and Use Attentions

- Do not allow unauthorized demolition.
- Avoid strong impact.
- Avoid closing to the magnetic field.
- Do not put this machine a long time in a hot environment.
- Do not put this machine a long time at a low temperature environment.
- Do not click on the screen violently or by using weapon.
- Do not use water and chemical solvents to clean the machine, using a soft clean cloth and neutral detergent to clean.

Automobile Inspection Notes

- Shall operate by adhering to auto repair industry safety rules. Special attention to the impact or damage caused by the environmental factors such as the surrounding pH, poison gas, high pressure heavy.
- Vehicle battery fluid contains sulfuric acid, while sulfuric acid is corrosive to the skin, in operation should avoid skin having direct contact with battery fluid. Particularly, be careful not to splash into the eyes. Avoid nearing fire.
- Engine exhaust emissions contains a variety of toxic compounds, should avoid inhalation .when operating, the vehicle should be parked in a well-ventilated place.

- When the engine is running the temperature is high, should avoid contact with high temperature components such as water tank and exhaust pipes.
- Before starting the engine, should hold the handbrake, gear lever is placed in neutral (manual transmission) or〖P〗 gear position (automatic transmission), so as to avoid the vehicle rushing out and cause accident when starting the engine.
- Before repairing the vehicles, hold parking brake well, shift transmission gear into the neutral position or P gear, and lower the driver's seat side glass doors and windows.
- If the engine can start, first warm up to normal temperature (water temperature at about 80 ℃), and close the auxiliary electrical appliances (such as air conditioning, lighting, sound, etc.).
- Find the Diagnostic socket of this car , and check, confirm the Diagnostic socket line intact, connecting the main unit for diagnosis. Otherwise, do not test, to avoid damage to the main unit, if necessary, using a multimeter to measure the voltage of Diagnostic socket.

Instrument Use Notes

- When use FCAR F3-D products for testing, you must handle with care and be away from heat and electromagnetic field, to avoid interference with the main unit.
- When electrical components energized, you can not disconnect the circuit to prevent the self-inductance, mutual inductance attacking sensors and automotive ECU.
- When electrical equipment works, avoid putting non-magnetic objects close to the vehicle control unit, otherwise the vehicle control unit may be damaged.
- When dismounting vehicle control unit or electrical components, must be carried out 1 minute after turning off the ignition switch.

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Shanghai Volkswagon ..... 错误!未定义书签。
FAW VW ..... 错误!未定义书签。
TJ-FAW ..... 错误!未定义书签。
Hainan Mazda ..... 错误!未定义书签。
Dongfeng Peugeot Citroen Automobile ..... 错误!未定义书签。
DF KIA ..... 错误!未定义书签。
CHERY Automobile ..... 错误!未定义书签。
BeiJing Hyundai ..... 错误!未定义书签。
SOUEAST ..... 错误!未定义书签。
Brilliance China Auto ..... 错误!未定义书签。
Changan Auto ..... 错误!未定义书签。
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OPEL Auto ..... 错误!未定义书签。
Benz ..... 错误!未定义书签。
BMW Auto ..... 错误!未定义书签。

1. Product Introduction

1.1 Introduction

As professional multi-functional intelligentized automotive diagnostic computer equipment, FCAR Series products follow International Standard Design. With the big color touch screen, high resolution display integrated structural design, single-track working and touch operation etc these special designs make you feel more cozy, conveniently and faster during diagnosis. In addition, FCAR F3 series product adopt flexible drive technology and has good extensibility, which fully satisfies the test of all kinds of communication bus of vehicle electronic control system.

1.2 Features

The hardcore of Fcar auto diagnostic computer follows the international advanced modularized design technology, with the excellent performance of high speed , stability, data collection accurate, etc.

With openning structure design and independent operating system, making the future upgrade of system software and diagnostic software more convenient.

Its working power supply is from Vehicle storage battery which can meet the voltage change between 9~27V. Internal power supply adopts separating power supply design which can avoid products to be damaged when vehicle voltage is abnormal.

Good extensibility, its communication interface adopts flexible drive circuit which not only can satisfy the current auto bus type test,but also the auto bus type test in the furture.Built-in high and low speed CAN-BUS, to satisfy the CAN-BUS electronic control system vehicles , Just only one diagnostic interface can test all of vehicles with CAN-BUS. Support All OBD-II protocols.

Build-in high speed thermal Printer for the convenience of maintenance personnel to record data and save Trouble code etc..

Screen follows International standard LED true-color industry touch-screen. It is good guaranteed under strong sunshine and bad conditions

Multi-language operation edition which can be applicable to different countries and areas.

1.3 Care and Maintenance

1.3.1 Storage environment

1）Store FCAR on a flat and dry place with suitable temperature.
2）Never put FCAR in direct sunlight or near to the heating source.
3）Never put FCAR in the magnetic field.
4) Avoid smoke erosion,water and oil splashing into FCAR.
5）Avoid shock,dust,moisture and extremely high temperature.
6） Power off the machince and make sure the power cable is removed,then clean the outside surface and touch screen with soft cloth that is dipped with a little water if main unit is dirty.
7) Periodically startup FCAR main unit if it is not operated for long time to avoid moisture.

1.3.2 Main Unit Protection

1）Handle with care. Avoid hitting.
2）Be careful to pulg and unplug the main cable and diagnostic connector.Tighten the screw before operation to avoid unexpected disconnecting and/or damage to the diagnsotic port
3）Put back the machine and cables,connectors etc. accessories to box to avoid loss.

1.3.3 Touch screen Care

1）Dust may be accumulated on the LCD screen due to electrostatic. Suggest to buy the special LCD screen wiper to clean the screen gently.
2）Don’t wipe the screen with bare finger to avoid fingerprint attached. Never use chemicals to clear the screen.
3）Never put FCAR to close the electromagnetic wave products to avoid any effect on the screen
4）Never put FCAR in direct sunlight or ultraviolet radiation for long time to extend the life of screen.

1.3.4 Precaution on operation

1）Forbiden to switch main unit frequently and Cut off the power suddently, power supply instability and abnormal power supply etc..
2）Unplug the power after operation to save the product life.
3） Never insert or pull out SD card when machine is turned on to avoid sd card damage or sd card data loss.
4）Don’t expose product under the chemical volatility environment to avoid any corrosion of hardware.

5）Never clear product with chemical solubility reagents like banana water, engine cleaning agents,gasoline etc..

6）Don’t put anything on the screen to avoid any damage.

7）Periodically startup FCAR main unit if it is not operated for long time to avoid moisture.

1.3.5 SD Card Maintenance

1) Do not switch on/off Fcar main unit frequently;

2) Adopting antistatic precautions to avoid static electricity to contact SD card;

3) Do not operate SD card during upgrade or connection to main unit until data transmission completed.

4) Do not plug or unplug SD card with electricity or brutal force

5) Please remember the password if encrypt the content of card, or not to encrypt data.

6) Please use high-quality data transmission device during connection

7) Randomly plug and unplug SD card from main unit are strictly prohibited during the operation of main unit.

8) Do not use cleaning liquid or water to clean SD card;

9) When insert SD card, the insert direction must be correct(Error insertion will be lead to damage of SD card or SD card slot)

10) Do not twist and bend SD card.

1.4 Help

FCAR series product, provided with supporting service, is easy and simple to maintain. From purchase, use, upgrade, to maintenance etc., the marketing network that spread over various regions will provide you with the most convenient and efficient service.

FCAR company provides users with online help. If you want to know the company's latest product, or automotive diagnostic information, you can log on "FCAR" Website via the Internet: http://www.fcar.com or company forum: http://www.fcar.com/bbs/, You will be offered with comprehensive and detailed help service.

2. Product Configuration

2.1 FCAR Hardware Introduction

Main unit(Front side)

1,On/OFF button 2, Paper out button 3,Printer

Figure 2.1.1 Main unit structure diagram

Figure 2.1.2 Main unit structure diagram

2.1.1 FCAR Main Unit Frontside Configuration

Figure 2.1.1 is the frontside structure diagram of FCAR Main unit.

No.	Name
1	Main unit ON/OFF button
2	Printer Paper Out Button
3	Printer paper outlet

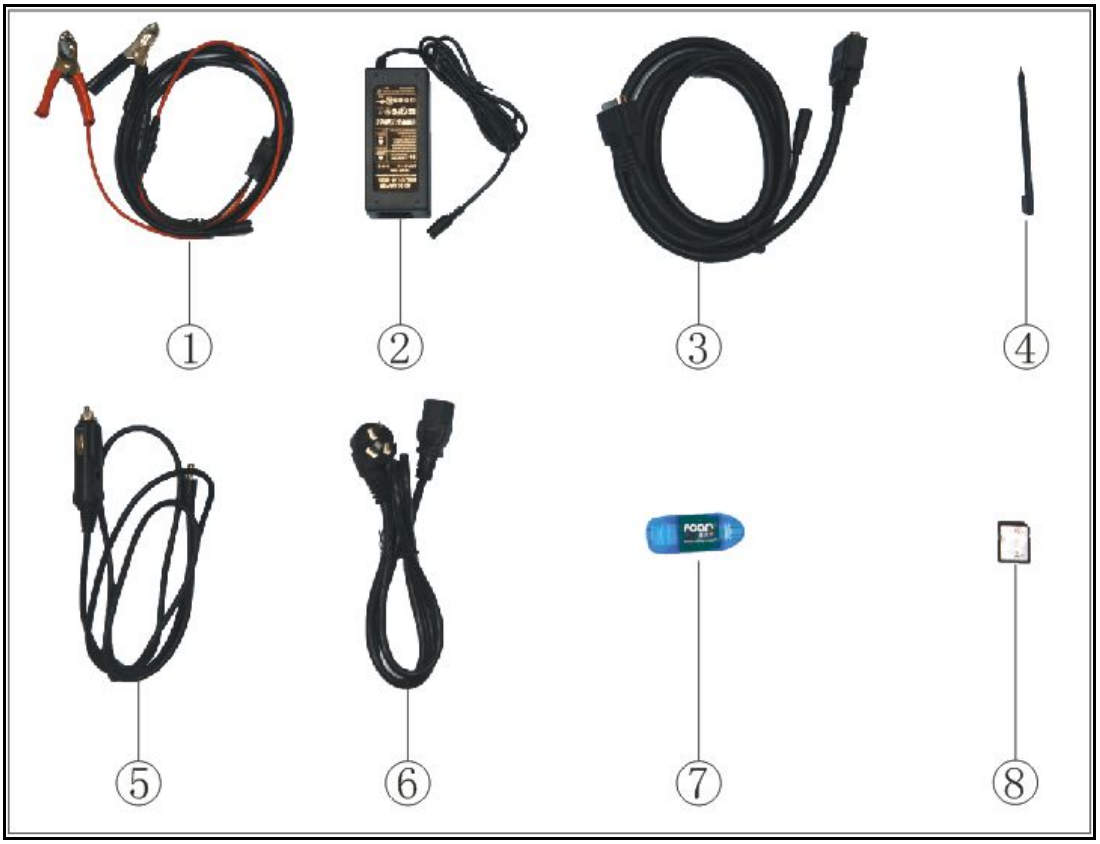
2.1.2 FCAR Main Unit Side Configuration

Figure 2.1.2 is the top structure diagram of Fcar main unit.

NO.	Name
1	SD Card slot
2	Power inteface
3	Diagnose interface
4	Touch pen

主机（顶部）：Main unit(Top)

2.1.3 Common Accessories Introduction



Picture 2.13 common accessories

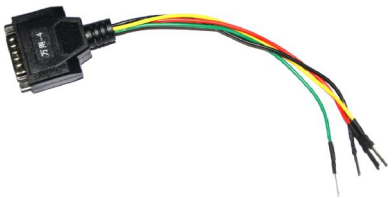
No.	Name	No.	Name
1	Double clamp power cord	5	Cigarette lighter power cord
2	220V power adapter	6	Adapter power cord
3	Main testing cable	7	SD Card reader
4	Touch pen	8	High speed SD card

2.1.4 Diagnostic Connector Introduction

No.	Photos	Name	Description
1		[OBD Ⅱ-16]	Applicable to vehicles with CAN BUS or Non-CAN BUS system
3		[Magnetimarelli-3]	Connect to Magneti Marelli Electronic controlled injection engine
3		[NISSAN-14]	Connect to Nissan 14pin diagnostic socket
4		[MITSUBISHI-12]	Connect to Mitsubishi 12Pin diagnostic socket
5		[HONDA-3]	Connect to Honda 3Pin diagnostic socket（note: ABS needs adjusting code by hand）

No.	Photos	Name	Description
6		[KIA-20]	Connect to Kia 20-pin diagnostic socket
7		[MAZDA-17]	Connect to Mazda 17 semicircle models
8		[TOYOTA-17]	Connect to Toyota 17-pin diagnostic socket in engine compartment(note：some cannot detect data stream)
9		[JEELY/MAZDA-17]	Connect to Jeely/Mazda square diagnostic socket
10		[GM-DAEWOO-12]	Connect to GM,DAEWOO 12Pin diagnostic socket
11		[TOYOTA-22]	Connect to Toyota 22Pin diagnostic socket

No.	Photos	Name	Description
12		[BENZ-14]	Connect to Ssangyong 14-pin diagnostic socket
13		[MITSUBISHI -12+16]	Connect to MITSUBISHI 12-pin and 16-pin diagnostic socket
14		[BENZ-38] （Subject to packing list）	Connect to Benz 38-Pin diagnostic socket
15		[BMW-20] （Subject to packing list）	Connect to BMW 20-Pin diagnostic socket
16		[HYUNDAI-10]	10-pin connector for matching Hyundai remote control
17		[CITROEN-2]	Connect to Citroen 2-Pin diagnostic socket

No.	Photos	Name	Description
18		[MINIATURE-3]	Connect to MINIATURE 3-pin diagnostic socket
19		[MINIATURE-4]	Connect to MINIATURE 4-Pin diagnostic socket
20		[AUDI-4]	Connect to Audi 2+2 diagnostic socket
21		[QINGLING-3]	Connect to Qingling 3-Pin diagnostic socket
22		[UNIVERSAL-4]	Connect to various diagnostic sockets

2.1.5 Other Accessoris

NO.	Photos	Name	Description
1		Product User's Manual	Introduction of product usage
2		Certificate of approval	Certificate for product warranty and qualified certification
4		Envelope	store warranty card
5		Product packlist	For checking the packaged goods
6		Software Inventory	For checking the current software configuration information

NO.	Photos	Name	Description
7		Outer package box	Overall package of product
8		Product box	Assembling product
8		Training Log	User training and maintenance experience recording
11		Printing paper	Print for the detection result and data reference report
13		fuse	Used to prevent the anomaly of Main Unit due to excessive Current of Main Unit(used on cigar lighter and battery folder)

Remarks: The actual configuration subject to the packing list in purchased product due to continuous update of hardware, software and configuration.

Figure 2.1.6

Item	Unit/ method	parameter
Print method	Thermal dot-matrix Printing	
Number of rows	(dot-matrix / row)	384
Resolution	(dot-matrix / mm)	8
Paper width	（mm）	58＋0-1
Print width	（mm）	48
Print speed	（mm / s）	62.5
Paper feed method	Direct in	Bend out
Detection mode	Thermal-Printing head temperature\ Heat inductor	----

Table 2.1.7

Figure 2.1.8.1

2.1.6 Main Unit Parameters Introduction

Hardware parts	parameters	type
CPU	200MHZ	SAMSUNG ARM 2410A
RAM	64M	SMD
Flash memory	SD card	Plug type
Power	12V/3A	DC direct voltage
Diagnose interface	---	DB15
SD card interface	---	National standard
Display	8-inch LED	TFT LCD Color Touch Screen
External dimension	290.7×207.3×45	mm
Net weight	1390	gram

2.1.7 Printer Parameter Introduction

FCAR F3 main unit built-in mini thermal printer, adopting the way of direct in and bent out, reduced the risk of printing stuck. Table 2.1.7 is the printer parameters.

2.1.8 Printing Paper Installation

1,Put main unit flat on desk or other flat surface, pull outward printer and take out cover plate on the lower part of main unit, as shown in Figure 2.1.8.1.

Figure 2.1.8.2

2：Take the printing paper navigation bar down from the printer as shown in Figure 2.1.8.2.

Note: When taking out the printing paper navigation bar, first take down the left side(navigation bar left side has no gear) and then the right side, the wrong order can lead to abnormal wear on the navigation bar gear or damage to navigation bar .

Figure 2.1.8.3

3：Unpack the printing paper provided by FCAR company and pulled out printing paper from the roll of paper about 5cm, put the printing paper into the installation slot, hold the printing paper beginning end, as shown in Figure 2.1.8.3.

Note: the exit of printing paper must be installed downward, the wrong installation direction can result in the printer can not print.

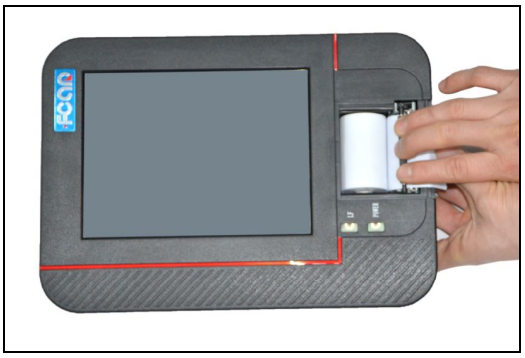


Figure 2.1.8.4

4: Install the printing paper navigation bar on the navigation bar bracket, as shown in Figure 2.1.8.4.

Note: when installing the print paper navigation bar first install the right side of navigation bar (the right side with gear), then place printing paper in the most middle (if printing paper is not in the most middle of the navigation bar, can cause the printer jams or the contents printed out drift), and then install the left side.

Figure 2.1.8.5

5: Because of using thermo printing paper, error installation direction will cause failure to print, installation direction of printing paper as shown in 2.1.8.5.

Figure 2.1.8.6

6: Passing the printing paper out from the paper exit in the back of printer paper cover as shown in Figure 2.1.8.6, according to the reverse order of dismantling printer cover to install the printer cover, and to ensure that the printer cover board bayonet and the main unit cover locked.

7: Tear down the extra printing paper, as shown in figure 2.1.8H (normally tearing the printing paper off rightward).

图 2.1.8.7

8: Main unit power on, select Print on the main unit menu, and check the results printed out to ensure that the printing contents normal, no stagnation and abnormal noise phenomenon.

Remark: In the case of main unit working, press 【LF】button on the left side of printer, printing paper will automatically deliver paper, make sure the integrity of printing results

3. Operation Guide

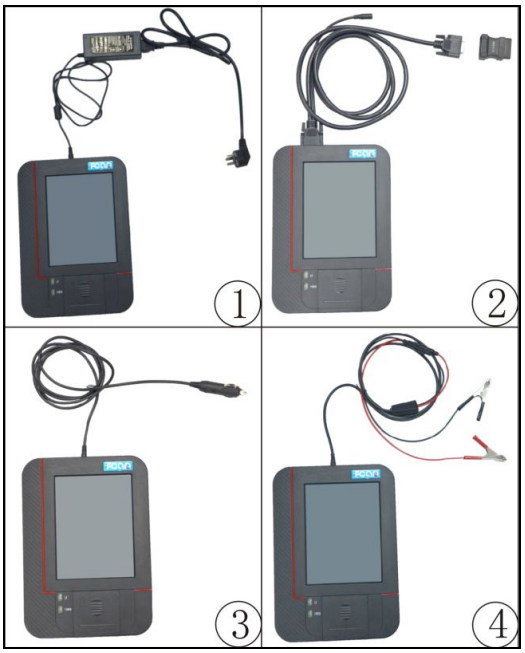


Figure 3.1.1

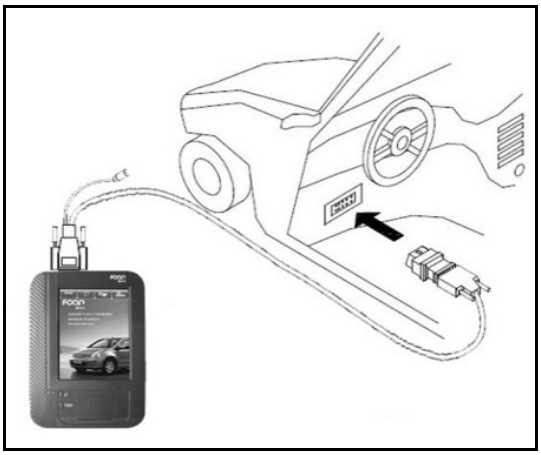


Figure 3.1.2

3.1 Power and Testing Cable Connection

3.1.1 Main Unit Power Supply

FCAR F3 main unit power supply has four kinds of ways, as shown in Figure 3.1.1

① Power supply by power adapter

② Power supply by main testing cable, connector and vehicle diagnostic socket

③ Power supply by connection of cigarette lighter with vehicle

④ Power supply by connection of battery terminal line with vehicle battery

3.1.2 Cable Connection Method

Option of power:

If the diagnostic socket not with power supply, Can choose ① ③ ④ in 3.1.1 one of these three power connection methods to provide power for the main unit.

If the diagnostic socket with power, you do not need to connect another power cord.

The connection of testing cable as shown in Figure 3.1.2

The prerequisites for vehicle：

1 Confirm the diagnostic socket location, shape, and whether need for external power supply.

2 select the appropriate connector base on vehicle model and shape of diagnostic socket.

3 Connect one end of the main testing line to the other end of main unit diagnostic connector.

4 plug diagnostic connector that connected with the main testing line into the vehicle diagnostic socket.

5 confirm that main unit with power and start up.

Remark: Diagnostic interface in Fig.3.1.2 is standard OBD-II interface, when connecting, 2 ends of main testing cable are required to

Figure 3.13

Figure 3.2.1

separately connect with OBD-II connector and fcar main unit, plug OBD-II connector into vehicle diagnostic socket to finish connection.

3.1.3 Start Up

Through any one of the four power supply power ways introduced in 3.1.1 to supply power, press the button [POWER] in the bottom left of the main unit screen. The main unit will be getting started, and then enter into the running state. As shown in Figure 3.1.3.

3.1.4 Shut Down

After usage of this equipment, operating touch screen back to desktop, press the [POWER] key in the bottom left of the main unit screen to shut down. As shown in Figure 3.1.3.

Notes:

When startup or shutdown, the button operation time is generally 1 ~ 2ms, long press the On and Off button can cause key failure.

3.2 Starting Up Interface Menu Introduction

3.2.1 Starting Up Interface

Connect the power supply, press the power switch key, the screen first appears FCAR product identification, then at the top of the starting up progress bar appears【if you want to adjust the touch screen please click screen directly】, as shown in 3.2.1.

Notes:

If you need adjust touch screen, please at this time click on anywhere of the screen with the touch pen to enter adjustment mode. During adjustment, you must use touch pen to adjust.

If don't need touch screen adjustment, the system will automatically enter desktop in 2ms.

Figure 3.2.2

Figure 3.2.3A

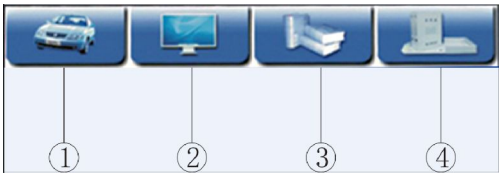


Figure 3.2.3B

3.2.2 Starting Up Screen Adjustment

In Figure 3.2.1, if use touch pen to click on anywhere of screen, the main unit menu enter into the touch screen adjusting mode.

The main unit screen prompts 【Please click cross cursor (the more precise alignment , the better for your adjustment)】, click on the cross cursor appears on the 4 corners of screen in turn with a touch pen counter-clockwisely from top left corner of the screen. Figure 3.2.2 is the display of menu after entering adjusting mode.

After adjustment, and the main unit shows correct information , then log on to the desktop menu.

3.2.3 Desktop Menu Description

When the main unit starts normally, the main unit will enter the desktop menu, as shown in Figure 3.2.3A. The top of desktop is the menu bar. Desktop background displays product models, update Web site, the service network.

Desktop top from left to right are

1: 【Diagnostic function】

2: 【System Setting】

3: 【Professional Dictionary】

4: 【Maintenance information】

Note: in the bottom right position of the menu shows ****date ** month ** year representing the last update time of the software program.

1	Trouble diagnostic program
2	System setting
3	English-Chinese Dictionary
4	Maintenance Information

Figure 3.3

3.3 Use of Diagnostic Program

Test program of FCAR F3 series classified into China, Japan, Korea, Europe, America and OBDII as shown in Figure 3.3.

China: Including current main unit configured global gasoline vehicle software in menu

Japan: Including current main unit configured Japanese gasoline vehicle software in menu.

Korea: Including current main unit configured Korean gasoline vehicle software in menu.

Europe: Including current main unit configured European gasoline vehicle software in menu.

America: Including current main unit configured American gasoline vehicle software in menu.

OBDII: All gasoline vehicles with OBD II connector.

Figure 3.4

3.4 System Settings

Select the menu 【System settings】with the touch pen at the top of desktop, then appears the sub-menu of the system setting menu. Sub-menu as shown in left figure3.4, were:

【System info】

【Touch adjust】

【User information】

【System theme】

【Language setting】

【System activation】

【Clear Data】

Figure 3.4.1

3.4.1 System Information

Select【System Information】and entered, the main menu pop-up dialog box for the hardware information, operating system version, software version, database version, memory information of product. Operating the button【OK】 on the left side of menu to return to previous menu.

Operate 【Diagnose】 button on the right side of the menu, then the device will diagnose automatically. As shown in Figure 3.4.1.

Note: During self-diagnosis, must use external power adapter configured with product to supply power, can not connect to vehicle or other equipments, otherwise, diagnostic results will have errors.

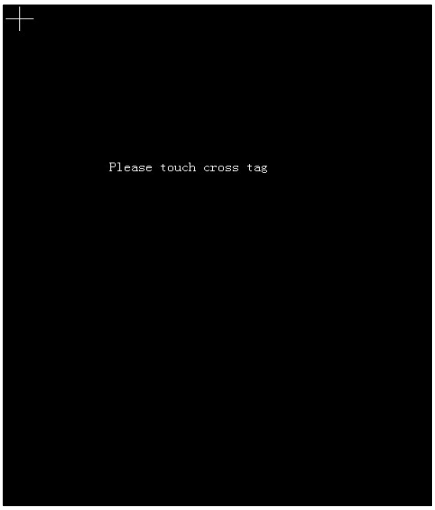


Figure 3.4.2

3.4.2 Touch Screen Adjustment

This feature is for screen deviation adjustment in the operation of main unit functions when using touch pen to select the main menu, the menu the main unit entered is not the actual selected. Operation method is the same with starting up screen adjustment. Detailed operation method see 3.2.2.

Note: when can not adjust through the touch screen adjustment menu, you can adjust it at the time of starting up.

3.4.3 User Information

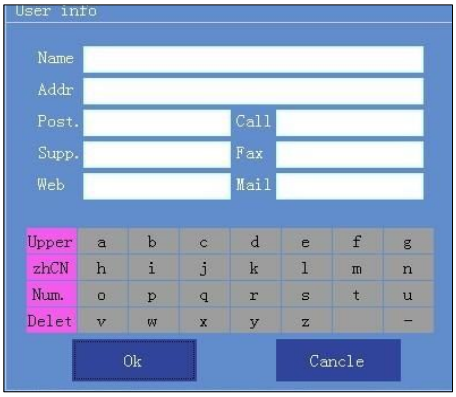


Figure 3.4.3

After user purchase equipment, fill in information by themselves: Company name (can fill in company name or individual name), address (to help customers who need repairs easy to find the detailed address), zip code, telephone, fax, support, website, email. Relevant information about the user. Information shown in Figure 3.4.3. After finished input press 【OK】 button to save.

Note: when input, you must first select the right input location. 【capital】 in keyboard area of the bottom of the screen is for changecase. 【ZhCH】 is for conversion between Chinese and English.【Letters 】 is used for conversion between the letters and numbers.【Back】is for user to delete the inputted error character or letter.

3.4.4 System Theme

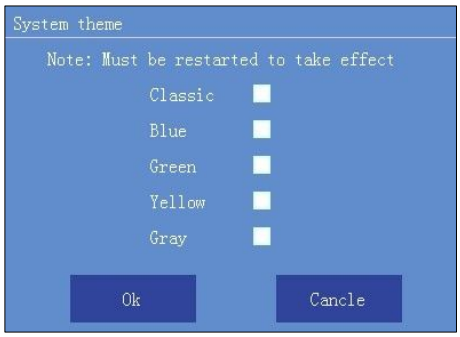


Figure 3.4.4

Used for setting programs menu background . 5 themes in total available: Classic, Blue, Green , Yellow, Grey, as shown in Figure 3.4.4. The Setting theme is based on working environment to avoid the visual gap between different environments. When setting, select the appropriate theme in the system setting dialog, and click on the small box behind the theme to select, then click 【OK 】button to save. Press 【Cancel】 button to cancel this operation.

Note: After changing the theme, the main unit is required to restart to make the new theme taken effect.

Figure 3.4.5

3.4.5 Language Setting

The menu is used for setting language type of main unit. Six language options are available: simplified Chinese, English, Japanese, Spanish Russian, Traditional Chinese as shown in Figure 3.4.6. When setting select the appropriate language in the Language dialog, you can select by clicking on the small box behind the language, then click【OK】 button to save. Press 【Cancel】 button to cancel this operation.

Note: If change language type, you need to restart the main unit to have the new language patterns taken effect. If change without authorization for other languages, there would be no response after click on diagnostic menu.

Figure 3.4.6A

3.4.6 System activation

FCAR main unit when leaving factory has not been permanently activated, it only can operate 50times use (as shown in Figure 3.4.7, only after the user purchased, the user can activate the device through FCAR website or Email to FCAR service people. (some customer request to active by FCAR when shipping).

System active detail method pls ref. 6.1.

Figure 3.5

3.5 Professional Dictionary

When you fail to understand the professional vocabulary encountered in the routine maintenance and learning, you can enhance personal skills via professional dictionaries.

For example: after inputting "ETC" in the input box click 【Query】 button to search the word, system will display words related with ETC in the left column, select and click the appropriate search word, the word in Chinese can be automatically translated and display in the right column as shown in Figure 3.5.

If you're done, press the 【Exit】 key to logout.

Note: The dictionary supports full-writing and abbreviation.

输入：
查询
退出
a b c d e f g h i
j k l m n o p q r
s t u v w x y z
请输入保存的名称
大写 a b c d e f g
zhCN h i j k l m n
Num. o p q r s t u
回退 v w x y z -
确定
取消
请输入密码(0~65535)
1 2 3 4 5 6
7 8 9 0 清空
确定
取消

Figure 3.6

3.6 Maintenance Help System & Screen Keyboard

Maintenance help system & screen keyboard display differently in different versions, specific version is subject to real object.

3.6.1 Maintenance Help System

The maintenance help system covers match setting operating function and device operating methods of common models, operational function menu refer to Figure 3.5 professional dictionary。

3.6.2 Screen Keyboard

Different menus of FCAR main unit contain different input methods, As shown in Figure 3.6. three kinds of keyboard: letters input, uppercase and lowercase letters input and English and Chinese input and digital input, digital input.

4. Vehicle Diagnosis

4.1 The Technical Prerequisites for Diagnosis

Figure 4.2A

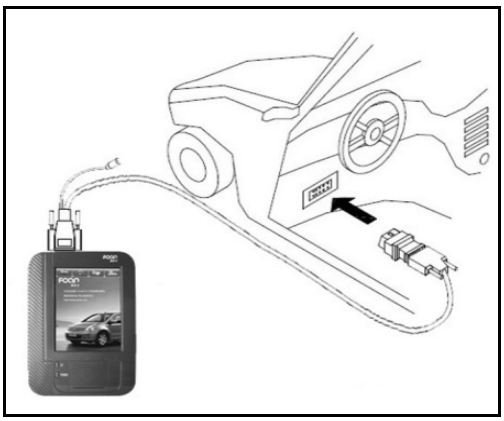


Figure 4.2B

4 .1.1 Equipment Requirements

Equipped with FCAR main unit and a variety of test connectors. According to the type of vehicle diagnostic socket, select the corresponding test connector.

4.1.2 Vehicle Requirements

1, Ignition switch ON.

2, car battery voltage should be between the 11-14V or 24-27V (subject to the power supply of vehicles).

3, Accelerator pedal in Off state, namely idle bonding point.

4, ignition timing and idle speed should be in the standard range, transmission temperature and oil temperature reach to normal operating temperature (water temperature 90-110 ℃, transmission oil temperature 50-80 ℃)

5, Diagnostic circuit is normally connected.

Different models have different diagnostic socket position, diagnostic seat position of vehicle model See 【8. the common car diagnosis socket position】.

4.1.3 The Requirements for Maintenance Technician

1) must have the basic knowledge of automotive electronics.

2) understand the basic operations of the equipment and familiar with operating instruction

3) about the tested vehicle trouble phenomena can basically distinguish between mechanical failure

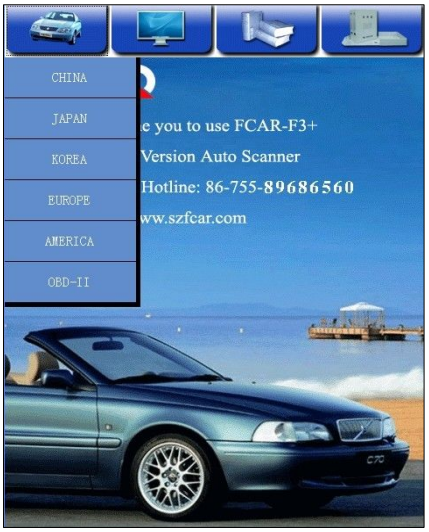


Figure 4.2.C

Figure 4.2.D

And electronic control part fault.

4) Understanding the origin, year of manufacture, model, engine model of the vehicle.

4.2 Steps of Vehicle Diagnosis

1, Find the location of vehicle diagnostic socket.

2, Select the connector according to the vehicle diagnostic socket model.

3, Connect the main unit to the wire or connector of the to-be-detected vehicle as shown in figure 4.2A。

4, Connect the testing connector to the vehicle diagnostic socket as shown in Figure 4.2B。

Note: If the power supply of diagnostic socket of diagnostic vehicle insufficient or its power supply pin damaged. You can obtain power supply by any of the following ways:

1) through the cigarette lighter cord: insert one end of cigarette lighter cord to automobile cigarette lighter hole, the other end of the FCAR main testing line connect to power plug.

2) through the double-clamp power cord: connect power clamp of double-clamp power cord to the battery positive and negative, insert the other end into the FCAR main testing line power plug.

3) through the power adapter: Insert one end of the power cable into 250V AC power socket, connect switch power supply plug to the power socket of FCAR main testing line.

5, open the ignition switch to ON or start the engine.

6, pressing (POWER) button on FCAR main unit.

7, Select the area of the vehicle that in current diagnosis in diagnostic program. For example: The current vehicle in repairing is BMW 730Li, the origin of BMW is Germany, Germany is classified in

Figure 4.2.1

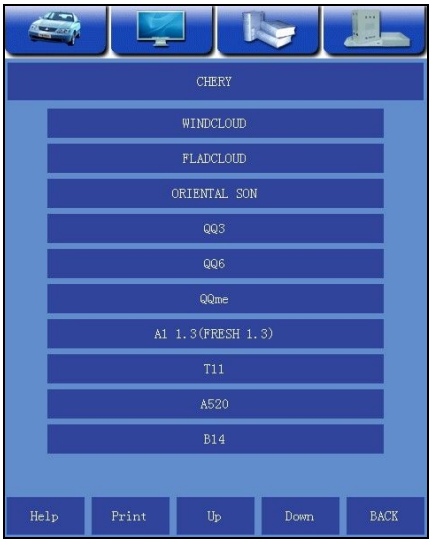


Figure 4.2.2

Europe according to the regional division, then need to select the European cars, looking for BMW series in Europe series. Figure 4.2.C is the division of regional major section.

8, Take Chery as an example to diagnose. If the currently testing model is Chery, Chery is Chinese car, so need to select the China. Entering into Chinese cars to find Chery, as shown in Figure 4.2.D. The menu appear the image and text simultaneously of the automobile manufacturers in China, the bottom of the menu has【Page Up】, 【Page Down】, 【Exit】.

9, According to Logo and name of Chery, It can be found in the first place of 4th row .

Note: Due to limited displaying of auto manufacturers per page, so need to find the software of the vehicle that to be detected through the Page Up , Page Down and the scroll bar on the right side.

4.2.1 Selection of Diagnostic Program Version

Click 【Chery】icon into the sub- menu. The menu prompts【Please select version】, as shown in Figure 4.2.1. Because the current version of Chery is one version, it currently shows one version V5.7. If there are multiple versions of the software, choose the higher version.

4.2.2 Selection of Vehicle Model

Click icon【V5.7】 into the next menu, the menu shows vehicle model of all the Chery series as shown in Figure 4.2.2.

In the test you need to know the test models, such as: which model of Chery, vehicle models can be obtained from the auto appearance, nameplate

and VIN code.Understand the model that currently need to test, select the correspondent model on the menu. If the testing model is the EASTAR model, select 【Eastar 】into the diagnostic system interface.

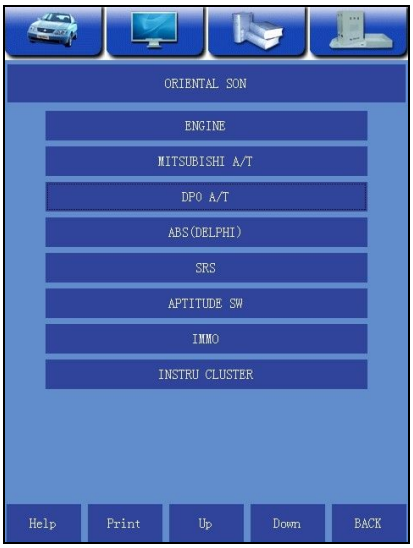


Figure 4.2.3

4.2.3 Selection of System

Select Eastar coincide with the actual vehicle, according to the vehicle current configuration to choose system that required to diagnose. In the menu of Eastar diagnostic procedures, not all vehicles has the same or complete configuration. According to different years and different regions, automobile manufacturers will make proper adjustments, so after entering the menu you will see the phenomenon of the coexistence of multiple systems as shown in Figure 4.2.3, then the maintenance technician need to identify according to maintenance manual or real object, to select the system that matching with the vehicle model.

Notes: if the tested system different from the selected system, it will leads to the tested system unable to communicate with Fcar auto diagnostic tool.

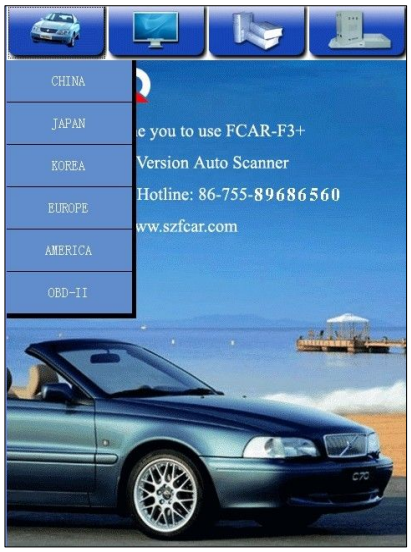


Figure 4.2.4A

4.2.4 Diagnosis Step base on Control system

After connection, press【start \ shutdown】 with attention to method and related matters to start Fcar main unit, after entering into【the system main interface】, then open trouble diagnosis menu to choose【Chinese series】. As shown in Figure 4.2.4A.

Note: take VW Audi as an example

Figure 4.2.4B

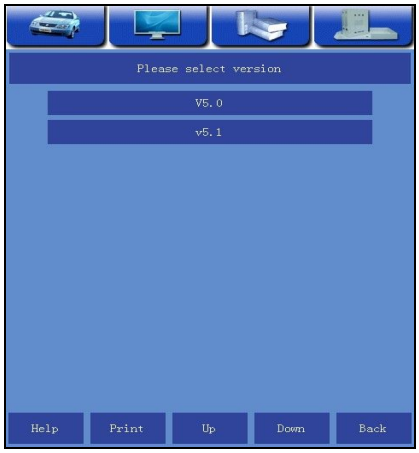


Figure4.2.4C

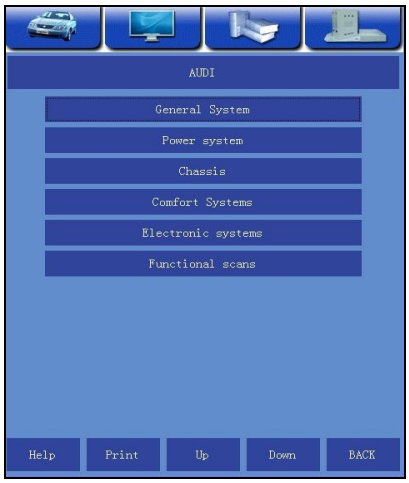


Figure4.2.4D

To find VW Audi on the menu through the 【Page Up】、【Page Down】in the bottom of the main unit menu as shown in figure 4.2.4B.

Click【VW Audi】series icon to enter the next menu.

Notes: In the menu of Fcar series products, VW Audi series were distributed in the menu of China and Europe respectively. In actual operation, make sure that the series that currently need to test whether belongs to European series or Chinese series. Chinese series have FAW-Volkswagen and Shanghai Volkswagen, the specific distinction can be obtained from the vehicle nameplate or instruction and other relevant certificates that can prove vehicle identification.

The information currently displayed on the menu is the diagnostic program version information. The menu displays that the version information is V5.7, as shown in figure4.2.4C

Note : select the version you need or the highest version to diagnose. The highest version of all software are fully compatible to the existing version.

After selecting the version number the menu enter into the software menu list. the software of the model in current test is divided into general system, power systems, chassis, comfort systems, electronic systems, functional scanning. As shown in Figure 4.2.4D.

Note: In this menu the maintenance technicians can choose the menu that meet their own needs according to the system that currently needs testing and test environment, time and other factors. For example: Currently maintenance technicians need to quickly test the engine systems, then select the menu 【power systems】

for quick access to the engine functional diagnosis. If currently maintenance technicians was engaged in the work of other functions and but need to check whether the vehicle electronic control system is normal, then select 【Functional Scan】 to test. During the functional scan, maintenance technicians can continue other work, after finished scanning, the tested system and system conditions will display on the menu so as to save time for technician .

Take 【General Systems】as an example. Select 【General System】to enter the next level menu.

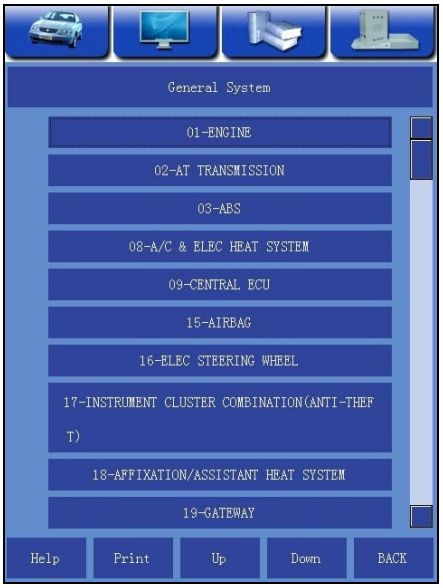


Figure4.2.4E

The menu display: 01-engine, 02-automatic transmission, 03-anti-lock brakes, 08-air conditioning system, 09-the central electronic control system 09, 15–Airbag, 16-Electronic steering wheel, 17–combined instrument(anti-theft), 18-Additional / auxiliary heating system, 19-Gateway, 22 four-wheel drive. Maintenance technicians can select to enter the system to test based on the system that needs to test. As shown in Figure 4.2.4E

Note: The systems displayed on the above menu are not actually existed in every vehicle. Different model, production sites, sales areas, configuration number, the system configurations are different. If you need to select some system to test, you need to ensure that the vehicle to be tested is configured with this system, and the power supply of the system to be tested is normal. Only when the signal communications normal ,entering the system to test can be allowed.

Select the appropriate test system for testing, when in the current menu can not find a suitable test system, you can operate the function key 【Up, Down】below the menu to search system.

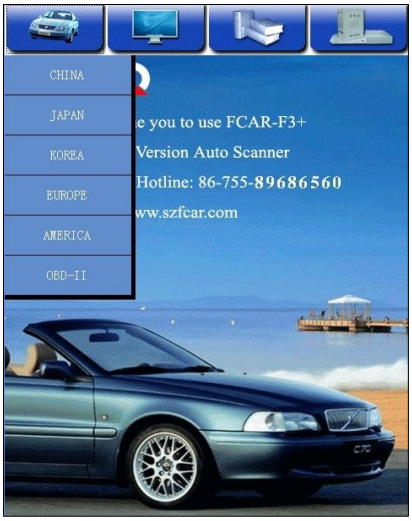


Figure 4.2.5A

Figure 4.2.5B

Figure 4.2.5C

Technical note:

(01-Engine) means that the address of the engine control system is numbered as 01 address by vehicle manufacturers. (17-Dashboard combination (Immobilizer)) indicates that the vehicle has two conditions exist, one situation is the instrument system contains anti-theft system, and the other is the instrument system does not contain the anti-theft system, in both cases you can enter system to diagnose. More detailed technical description please refer to vehicle maintenance manual.

4.2.5 Diagnosis Step Base on Year/Model

You can open Trouble diagnosis menu in the system main interface and select【American Series】
As shown in【Figure4.2.5A】

Here take 【GM】for an example.

After entering 【America】 the menu shows the current American Car manufacturers for testing, as shown in Figure 4.2.5B. Select the menu on the GM (GM) icon to enter the next level menu of GM.

Menu displays 【V5.1】,this information is diagnostic program version information of GM that currently in testing, as shown in Figure 4.2.5C.

Note: Select the version you need or the highest version to test or diagnose, the highest version of the software is fully compatible to the existing version.
Select the version that currently need to test into the next level menu.

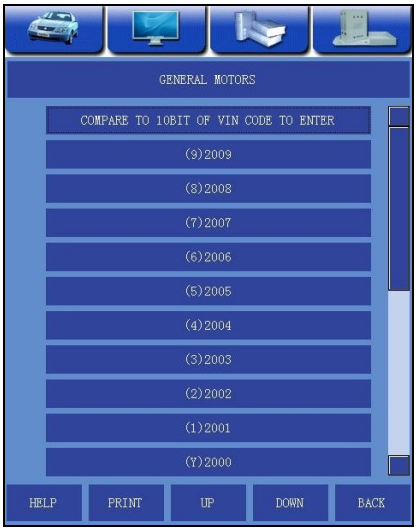


Figure 4.2.5D

The main unit menu displays【Select Year/Model (please compare with the 10-bit VIN code to enter). As shown in Figure 4.2.5D.

The origin and definition of VIN code:

VIN (Vehicle Identification Number), is a group of code designated by manufacturer for the sake of identifying a vehicle. VIN code is composed of 17 letters, also known as 17-bit identification code, or 17 bit number. Vehicle identification code as the only identification of the vehicle through the permutations and combinations, can make vehicle of same model have the same number within 30 years,. Thus it can be called "vehicle ID."

The location of VIN codes:

1) Except the trailers and motorcycles, they are on the door hinge column, door lock column, or the column of the joints of door lock column, close to the driver seat; fixed in the left side of the dashboard; fixed inside the door, near the driver seat.

2) Except the outside vehicle door, should be easily read from any parts of non-moving vehicles.

3) VIN code of most Chinese cars can be found in the left side of the dashboard, and left and right bottom corner of windshield glass.

4) On motor vehicle driving license, new driving licenses at "VIN" column are generally printed with VIN number;

5) Other places: such as the insurance policy, various nameplates of the engine room, driver side door pillar and so on. The most common and general locations are the left side and right side of instrument panel, suspension support, luggage compartment, beams, nameplate of fender inner plate.

Note: take【(9) 2009】 as an example.

Figure4.2.5E

Select【(9) 2009】Year/Model【Vehicle identification】information, which displays the model that can be tested. As shown in Figure 4.2.5E.

Notes:

According to the system that currently need to test select vehicle model that need to be tested.

Take Chevrolet produced in 2009 as an example.

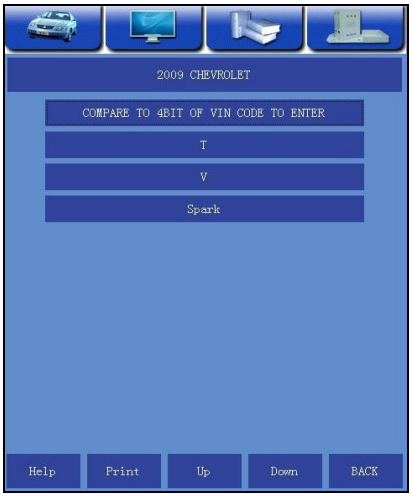


Figure 4.2.5F

Entering into【Vehicle Identification】information and choose【（1）Chevrolet】, appears 【2009 Chevrolet】VIN coding selection window, compare and choose according to the vehicle body VIN code as shown in figure 4.2.5F

Note : Take VIN code"V"for example.

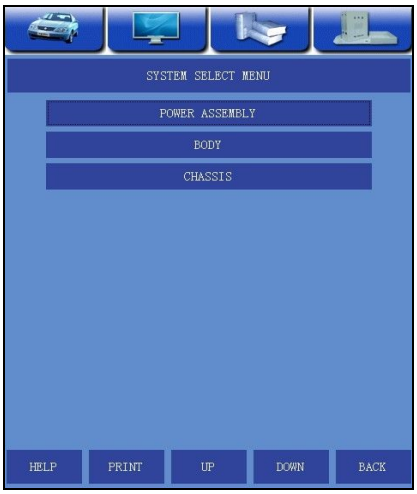


Figure 4.2.5G

【 System Selection Menu 】 shows 【 2009 Chevrolet 】 testable system list (power, body, chassis systems), click on the System Diagnostics Project for fault diagnosis. As shown in Figure 4.2.5G.

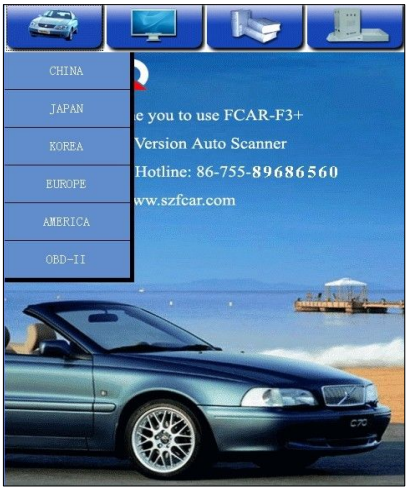


Figure 4.2.6A

4.2.6 Diagnosis step base on vehicle model

You can open Trouble diagnosis menu in the system main interface and select【Europe】
As shown in【Figure 4.2.6A】

Note : Here take 【BMW】as an example

Figure 4.2.6B

Entering into the menu【Europe】to select the logo of 【BMW】as sown in Figure 4.2.6B

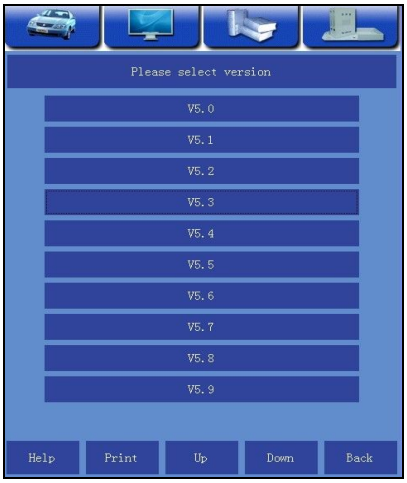


Figure4.2.6C

After clicking the BMW logs, the screen will display 【pls select version】as shown in Figure 4.2.6C

Note: Select the version you need or the highest version to test and diagnose, the highest version of all software is fully compatible to the existing version.

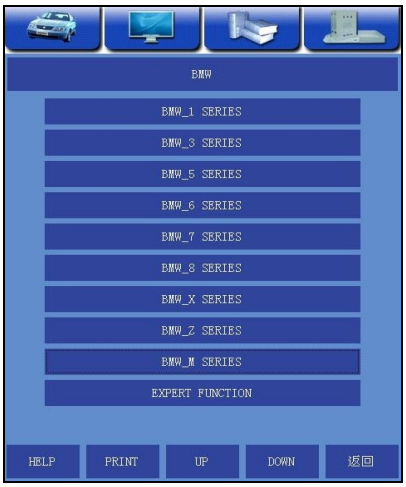


Figure 4.2.6D

After selecting the version, the screen will display the list of BMW series. As shown in Figure 4.2.6D

Note : Take【BMW-X series】for example

Select【BMW-X series】, the screen will display X series models and chassis information. As shown in figure4.2.6E

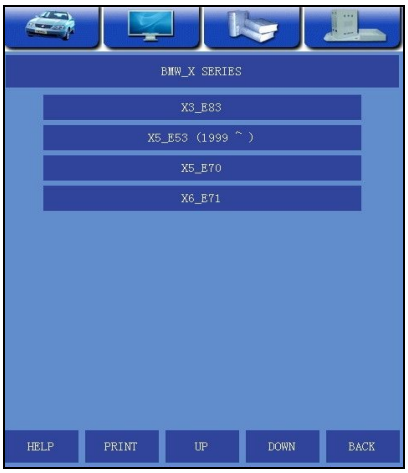


Figure 4.2.6E

Note : Take 【X3_E83】for example

Click【X3_E83】, will show system classification list. As shown in Figure e4.2.6F

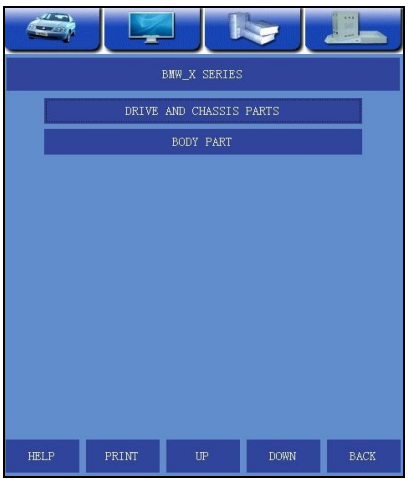


Figure4.2.6F

Take 【Drive and Chassis parts】of VIN code for example.

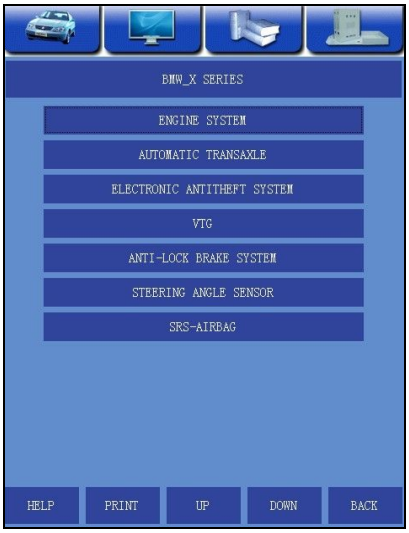


Figure 4.2.6G

Select【Drive and Chassis parts】,The Screen will display testing system list(Engine, transmission etc), click the system diagnostic item to diagnose, as shown in Figure 4.2.6G

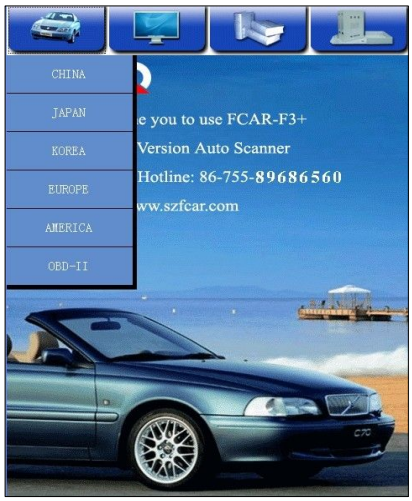


Figure 4.2.7A

4.2.7 Diagnosis Step Base on ECU Model

You can open Trouble diagnosis menu in the system main interface and select【Chinese Series】as shown in Figure 4.2.7A

Note : Here take【Engine system】as an example

Figure 4.2.7B

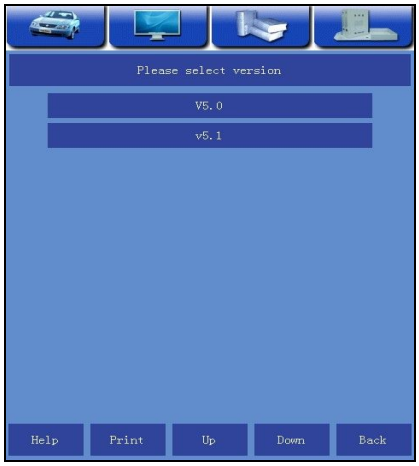


Figure 4.2.7C

Figure 4.2.7D

Entering 【Chinese series】Menu and select the logo of 【Engine system】as shown in Figure 4.2.7B

Click【Engine system】logo, the screen will display the prompt【 pls select version as shown in Figure4.2.7C

Note: Select the version you need or the highest version to test or diagnose, the highest version of all software is fully compatible to the existing version.

After selecting version, the screen will display the 【Engine】electronic control system list to diagnose as shown in【Figure 4.2.7D】

Note: The fault diagnosis can also be conducted in the ECU of same assembling and different model. But data stream, trouble code etc will be not accurate or information can't be displayed. Thus fault diagnostic computer menu should choose the diagnostic program that matched with the ECU model body assembled to diagnose.

Engine control systems assembled in domestic vehicles are comparatively more. Maintenance technicians can obtain diagnostic procedure menu of ECU mode from the electronic control system ECU's nameplate l.

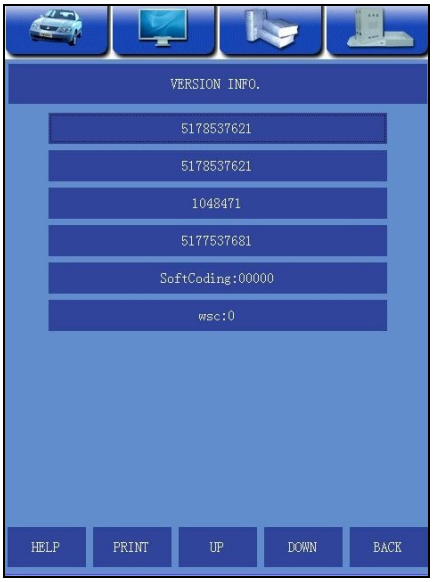


Figure 4.3.1

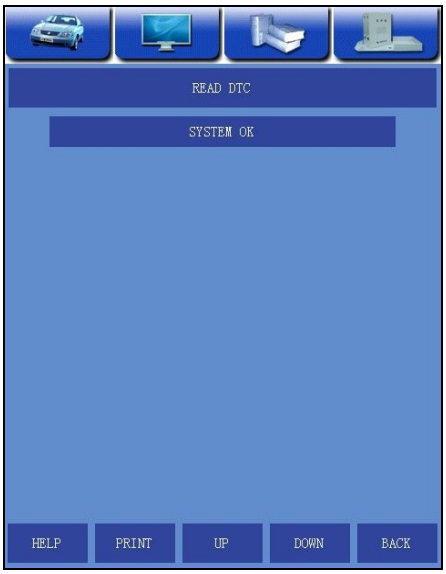


Figure 4.3.2

4.3 Diagnosis Function Option

4.3.1 Readout ECU model

After diagnostic communication with ECU, the screen will display some information such as ECU model, the type of system, engine model etc of diagnostic system.

Note: These information are from vehicle ECU, the content that the auto computer fault diagnostic tool displayed is ECU version information, which is the only number for ECU specified by manufacturer.

4.3.2 Readout Trouble Code

Used for reading the fault code recorded by auto ECU self-diagnosis, and make explanation about the fault content .as shown in Figure 4.3.2.

Note: Obtaining the fault code digital information from vehicle from random access memory RAM of auto computer control unit (ECU) through auto fault diagnostic computer.

Fault Code Analysis:

About the fault code, people who has some knowledge of vehicle maintenance will tell you, fault code refers to when the vehicle electronic control system such as engine or gearbox malfunction, the system control unit ECU or self-diagnostic module of ABS module detects system component fault to meet specific program conditions, and have the fault information in form of digital code stored in a special area within the module such as RAM, ROM, or to keep current in the memory KAM. When the vehicle

maintenance technician is in the diagnosis of vehicle breakdowns, these fault codes can be obtained from memory through the external auto fault diagnostic computer. By interpreting and analyzing the fault information corresponding to these codes, the maintenance technicians can quickly find faults, to avoid the diagnostic work going astray.

Fault Code Setting Conditions:

The whole control system is composed of many subsystems (sensors, actuator elements, power supply, computer) circuit. Therefore, the content of trouble code contains not only the sensor or actuator elements failures, but rather showing that the signal of the sub-system is abnormal , which may be caused by any part (components, connectors, circuit, or computer)of the sub-system, so fault code only provide the general direction of further testing for maintenance personnel, but does not tell us exactly what and where occurred failure. Therefore, fault codes mainly play the role of the maintenance guidelines.

When engine is working normally, Trouble self-diagnosis system will monitor the components of Electronic control system and ECU own work, Both the Level for all sensor input signal to ECU and the control signal output from ECU are in the prescribed range. Once the input or output signal of ECU is not in the prescribed range, self-diagnosis system will judge the signal is faulty, meanwhile the light on the dashboard will be immediately lit and store relevant trouble code into ECU’s memory. When conducting fault diagnois, you can get out the trouble code through the auto fault diagnostic instrument and find out the trouble location according to fault codes, which brings great convenience for the clearance of fault codes. However, if used incorrectly or rely on the trouble code too much, blindly repair or replace some components without any analysis. It can’t solve the problem and even it will result in new trouble and more problems.

The significance of checking diagnostic trouble code setting conditions carefully lies in: as vehicle maintenance personnel, he must know when did the vehicle's fault happen? Fault code is triggered because of what conditions? How to simulate conditions that the fault occurred?

Fault code tells you a certain system of the vehicle occurred a certain failure at present or in the past. Therefore only after being repaired, the fault code no longer appears and this shows fault information have been cleared. But remember, fault code may disappear because of inexistence of the fault. Similarly, if the fault monitoring system program was suspended because of the restriction of certain conditions, fault code will not appear either.

Analysis Steps of Fault Code:

A: Readout and record all fault codes
B: Clear all fault codes
C: Confirm that fault code has been cleared
D: Simulate the conditions that fault arise and make the road test

E: Re-read and record the fault code at this time

F: Distinguish between sporadic fault code (soft fault codes or irrelevant fault codes or historical fault codes) and continuous fault code (the current fault code or related fault code, or hard fault code)

G: Distinguish between the main fault and minor fault code that are relevant to fault symptoms

H: distinguish between various fault codes or the main fault codes among related fault codes (which might be the cause of other trouble codes)

I: Based on the above analysis, further detects accurately the sensor , the actuator elements or control computer and relevant circuit state represented by fault codes so as to ascertain the exact location of trouble spots.

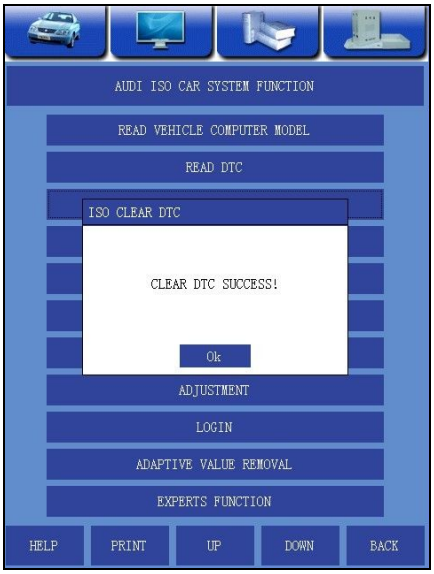


Figure 4.3.3

4.3.3 Clear Trouble Code

For the clearance of fault code that recorded by automotive electronic control system self-diagnosis. After troubleshooting, applying automobile fault diagnostic computer to clear fault information in random access memory ROM of vehicle computer. As shown in Figure 4.3.3.

Note: During fault diagnosis, first record or print out the fault codes for the reference of maintenance, and then clear. Fault code that can not be cleared is the existing actual fault, you should find vehicle fault and repair it first, then re-clear the fault code.

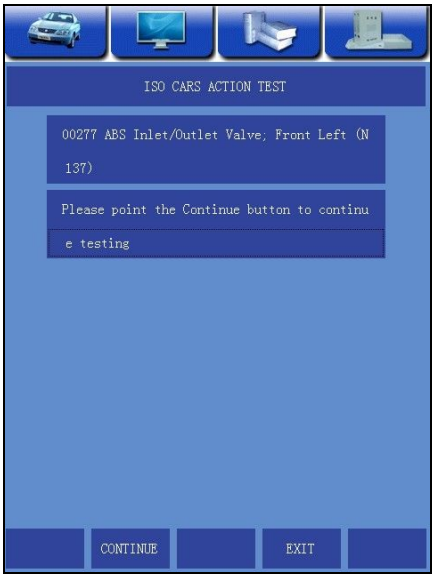


Figure 4.3.4

4.3.4 Component Control test

【Component Control Test】used for testing whether electronic control executive components and their circuit action are normal. As shown in Figure 4.3.4.

Note: When the test of all the executive components is completed, the screen will prompt "action test over, please exit"

In the static state (namely not start the engine) sending commands to vehicle computer through scanner, driving actuators to work to detect whether actuator is bad or not. The test content of the executive components as the electronic control systems are different, the test items supported are different. Mainly some solenoids, relays and other components. For example: take the Passat B5 as an example:

1: The test components supported by engine control system are: four fuel injectors, ACF electromagnetic valve etc.. In test, first start with cylinder 1 nozzle, conduct action test one by one until finished testing

all the components. At this time using Stethoscope to listening the action situation of components to determine whether the components work properly;

2: The test components supported by anti-lock braking system are hydraulic pump and oil line solenoid valve; in test, in accordance with the prompts of scanner, hydraulic brake and each oil line solenoid valve take action according to order, checking the action situation to determine whether the system work properly.

3:The test components supported by test instrument system are a variety of indicator and gauge needles, etc.; in test, all kinds of indicator lights, if a certain light bulb does not shine, then should check whether the bulb and its circuit are normal; all kinds of gauge needles at the same time turning from zero scale to full scale, check whether all gauge needles are normal.

Other electronic control systems of different models have different test components items according to their own characteristics.

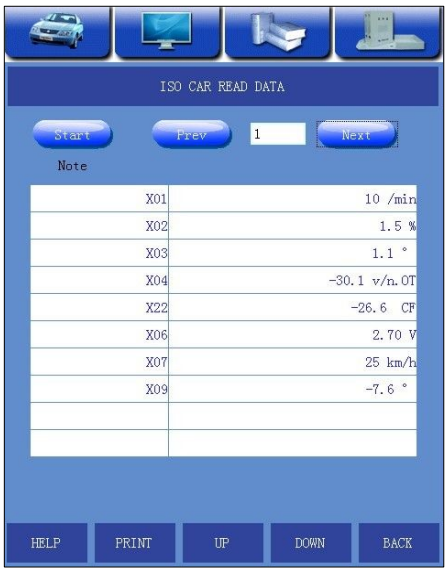


Figure 4.3.5

4.3.5 Readout Dynamic Data Stream

【Readout Dynamic Data Stream】can observe the operating data of vehicle ECU and sensor. As shown in figure4.3.5.

Note: Click【Prev】【Next】button to switch data stream Channel No. , also can click the text box, and imput the data set number on the pop-up 【Screen Keyboard】directly.

4.3.6 Basic setting

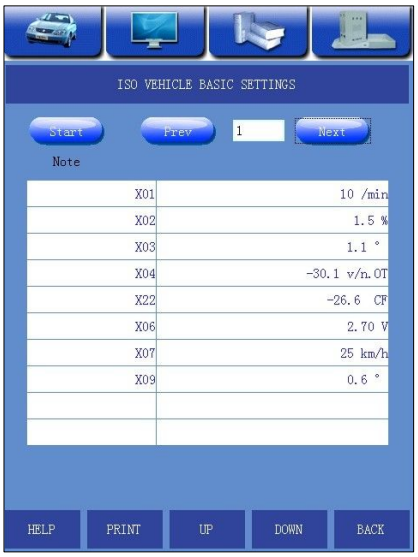


Figure 4.3.6

【Basic setting】is for conduct matching and synchronization between ECU and Actuator (Throttle, Idling Control unit etc)See Figure 4.3.6

Note: Click【Prev】【Next】Button to switch basic setting channel No. , you can also input the group No. in text box with soft keyboard directly.

* Before matching, All conditions for【basic setting】should be satisfied.

Knowledge of Matching Setting

The basic setting of Electronic Control Unit on modern vehicle, also known as setting, matching, programming, initialization adaptive and coding, is one of the technical problems often encountered in modern vehicle maintenance service. Now the vehicles are commonly equipped with a variety of electronic control system. Electronic control unit is the core component of electric control system. A lot of electronic control units (such as electronic throttle control unit, seat electronic control unit, rear view mirror electronic control unit, vehicle window electronic unit, skylights electronic unit, door lock electronic control unit, etc.) are with memory function, after the replacement of parts under their control, or unplug the battery cable when repairing faults, it is necessary to modify the information that stored or memorized in these electronic control unit, so that all the components of the electronic control system can adapt to each other, otherwise the system will not work normally.

Objective Factors for basic setting:

All systems that adopt ECU for automatic control, if the factors which effect the coordination between ECU and the components have the changes, then must do the basic setting.

1）After change new ECU, it haven't stored characteristic of throttle body
then need do the basic setting;

2）Replace or dismantle and assemble air inlet, need do the basic setting;

3）After clearing the throttle body, although the characteristic of idling throttle valve potentiometer don't have any changes, but under the same opening angle of throttle valve, air intake have had an abrupt change, so has the idling control characteristic, also need do the basic setting.

Types of Basic setting

1）ECU basic setting. The typical one is the basic setting of throttle body;

2）The basic setting of electronic automatic transmission;

3）The basic setting of electronic steering system;

4）The basic setting of body electronic control system;

Such as : The basic setting of power seats with computer memory function, the basic setting of headlight automatic adjustment device, matching of the key anti-theft system. Part of the Audi A6, Bora sedan equipped with gas discharge headlamps. The illumination angle of this headlight cannot be manually adjusted, but automatically controlled by lighting distance control unit. No matter what the car's load changes, can ensure the beam of Low-Beams remain unchanged and to prevent glare. If the automatically adjustment device of headlamps occurred failure, it must be conducted basic setting to recover the function of lighting distance automatic adjustment.

Requirements for Basic Setting

The basic setting of Electric Control System can be finished base on a certain condition. Take the VW engine throttle valve basic setting for an example, the precondition as below:

1）ECU No Trouble Code stored (So pls check the trouble code firstly , if have, clear the fault and clear trouble code);

2）Battery Voltage higher than 11V;

4）Coolant temperature higher than 80℃;

5）Turn off electrical equipment like Audio;

6）Turn off Air-conditioner;

7）Automatic transmission locate in Neutral Position or Park position;

8）Throttle body haven't any mechanical fault

9）Can't step on the accelerator pedal in the process of basic setting;

Note: if there is any error or halt when diagnose, pls check the above causes.

Precaution for Basic Setting

1) When diagnostic equipment haven't any available functions, pls check relevant electric control systems whether they still stored trouble code, if yes, pls repair these fault and then do basic setting.

2) Before setting the throttle body, pls clean it if the throttle body is dirty.

3) During basic setting, pls don't cut off the diagnostic equipment connector or turn off ignition switch in the operating process of any functions.

4) After repairing or replacing electronic components, some vehicles not only need to do basic setting, also need to clear the original learning value. Such as Jetta CiX

5) Few vehicles can finish the basic setting without auto diagnostic equipment. such as Audi 200/1.8T, Shanghai BUICK Century, OPEL, Daewoo etc, Turn on /turn off ignition switch to finish self-adjustment , So No need any basic setting.

6) Understand the engine characteristics of the vehicle that needs setting, whether setting at starting state of the engine or turn on the ignition switch under the shutdown state of the engine.

With the development of automobile technology, electronic control technologies are more and more widely applied in modern vehicles. Various complex control technologies offered a higher requirements for vehicle maintenance technician. When technician use the diagnostic tools to do electronic control basic setting, they must be strict in the operation step by step. Due to the basic setting methods are not same in every vehicle, so must refer to relevant data information.

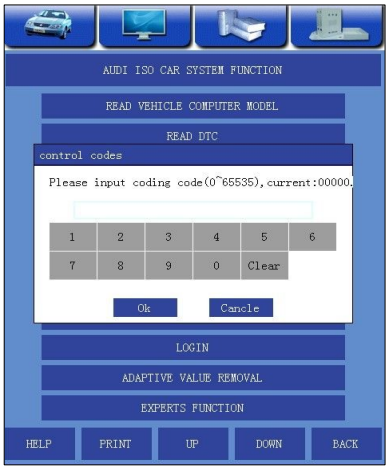


Figure 4.3.7

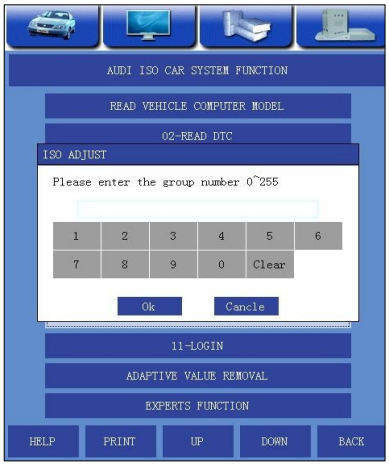


Figure 4.3.8

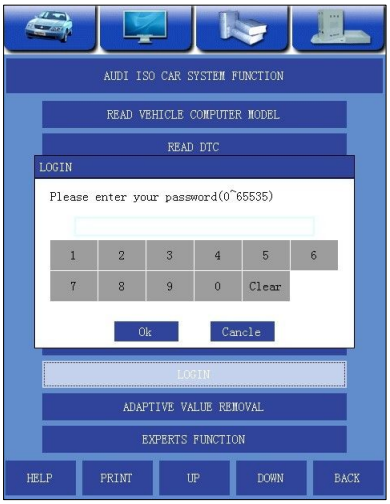


Figure 4.3.9

4.3.7 Controller Coding

【Controller coding】 If the vehicle code does not show or the host computer has been replaced, the control unit must be encoded. As shown in Figure 4.3.7.

Note: Click【Controller coding】,directly input the corresponding control unit code in the pop-up 【Screen keyboard】, click on【OK】, and it will prompt encoding success.

*** Error 【Controller code】will lead to poor performance of vehicles, even cause serious faults to vehicles.**

4.3.8 Adjustment

According to the demand of manufacturer and actual needs, to modify and input some setting value (matching)

Note: click【Adjust】and input the adjusted channel No. on the popup【 screen keyboard】, click【OK】, the screen will display coding success.

***Wrong 【Adjustment】 data will result in bad performance and other Trouble of vehicle.**

4.3.9 Login

【Login】Before performing the functions like"Code control unit, Adjustment and Anti-Theft decoding etc ", must perform this function firstly.as shown in Figure 4.3.9

Note: Click【Login】, then input the only password of the vehicle control unit directly, click【OK】, the screen will display login success.

*** if password is wrong for 3 successive times, ECU will forbid to login.**

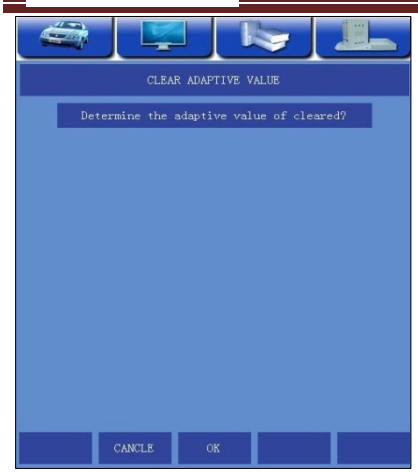


Figure 4.3.10

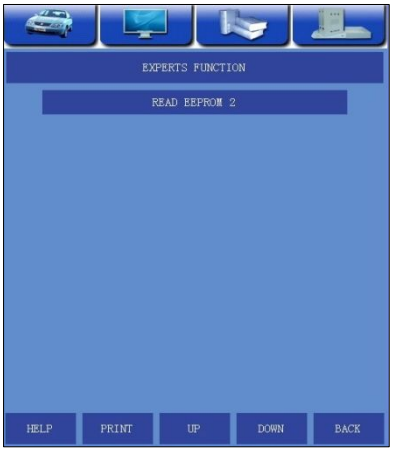


Figure 4.3.11

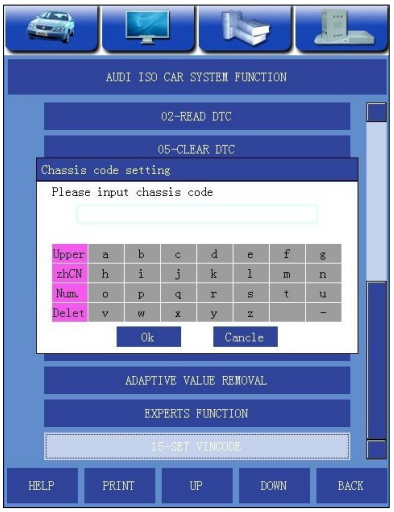


Figure 4.3.12

4.3.10 Self-Adaptive Value Clear

【Self-Adaptive value clear】You must delete the old value of ECU before performing the basic setting, anti-theft matching operation etc. As shown in Figure 4.3.10

Note: click【Self-Adaptive value clear】,there is a hint "confirm Clear self-adaptive value", click【Yes】, the Screen will display clear success

*** Must clear ECU self-study value firstly, then can learn the new self-study value.**

4.3.11 Expert Function and Special Function

Readout Instrument, EPROM Data of Anti-theft, can adjust the instrument and readout the password of anti-theft system. As shown in Figure4.3.11

Note: We can't make sure its operating stability as it is a special additional function, if adjustment is unsuccessful or ECU damage, these issues don't belong to product quality problem of FCAR, the user shall take the consequences of their own operation.

*** It is prohibited to use for illegal purposes. FCAR won't take any legal responsibility of the illegal use.**

4.3.12 Chassis Code Setting

【Chassis code setting】transmit the chassis model to ECU, as shown in Figure e4.3.12

Note: Click【Chassis code setting】then input vehicle chassis code on the popup screen keyboard. Confirm 【OK】,the screen will display a prompt for the code setting success.

4.4 OBD-II Function Diagnosis

4.4.1 Data Frame Freeze

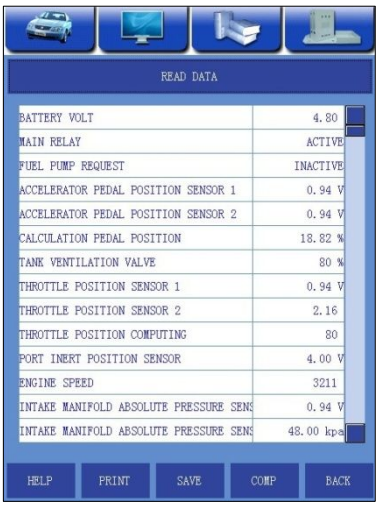
When the trouble code related to Automobile engine exhaust emissions appears, OBD-II not only set one trouble code, but also can record the relevant system operating parameters while the trouble code appear. The series data are called froze frame data: it includes Engine RPM, vehicle speed, air flow, engine load, fuel pressure, fuel modifier, engine coolant temperature, manifold pressure, and open-loop or closed-loop status etc.We can use OBD-II Trouble diagnostic program to freeze-frame testing of the vehicles which follows OBD-II Standard.

4.4.2 Readiness Tests

OBD-II system monitors multi-regions of the engine operating system, three regions of them are continuously monitored while other regions just will be monitored in certain conditions. Activating these discontinuous monitoring device need the vehicles under the work conditions of travelling the certain distance and time at a certain speed or special engine temperature、acceleration and deceleration alternately recycling etc to be monitored, this is called Readiness Tests

Not all of vehicles are applicable to this test. For those vehicles in OBD-II standard can be conducted the Readiness Test with OBD-II diagnostic fault diagnosis program.

Data stream test function


READ DATA
BATTERY VOLT 4.80
MAIN RELAY ACTIVE
FUEL PUMP REQUEST INACTIVE
ACCELERATOR PEDAL POSITION SENSOR 1 0.94 V
ACCELERATOR PEDAL POSITION SENSOR 2 0.94 V
CALCULATION PEDAL POSITION 18.82 %
TANK VENTILATION VALVE 80 %
THROTTLE POSITION SENSOR 1 0.94 V
THROTTLE POSITION SENSOR 2 2.16
THROTTLE POSITION COMPUTING 80
PORT INERT POSITION SENSOR 4.00 V
ENGINE SPEED 3211
INTAKE MANIFOLD ABSOLUTE PRESSURE SENS 0.94 V
INTAKE MANIFOLD ABSOLUTE PRESSURE SENS 48.00 kpa
HELP
PRINT
SAVE
COMP
BACK

Through establishing the communication between automobile fault diagnostic computer and automobile computer, get shared data out from RAM of the vehicle computer microcomputer to analyze vehicle trouble, so the data stream testing function is an important function of auto fault diagnostic computer. Data stream is divided into static data (KOEO) and dynamic data (KOER).

All vehicle that adopting microcomputer fault self-diagnosis system can using computer tester to readout the data stream that output by vehicle various electronic control unit microcomputer through diagnostic socket and reflects the electronic control unit controls system working conditions. Maintenance personnel can judge whether the electronic control devices work properly by making numerical analysis of various parameters of data stream, providing the basis for finding cause of the malfunction.

Parameters in data stream has two forms, numerical parameters and status parameters. The numerical parameters is the parameters that has certain units and a certain change range, which usually reflects the operating voltage, pressure, temperature, time, speed, etc. of each part in the work of the electronic control unit; state parameter is those who have only two states, such as on or off, closed or disconnected, high or low, yes or no, etc., it usually signify the working condition of the components of electronic control devices such as switches and solenoid valve.

In conducting numerical analysis, you must first distinguish between the various parameters are input signal transmitted to microcomputer from the sensor of electronic control device or the output command sent to the electronic control unit actuator by microcomputer. Input signal parameters can be state parameters, so can be numeric parameters. Most of the output command parameters are state parameters, a small part is numerical parameters. Data stream parameters can be classified according to various systems of vehicle and engine. Parameters of parameters of different types or different system have different analysis methods. During electronic control unit failure diagnosis parameters of several different types or different systems are needed to go through comprehensive contrast analysis. Different brands and different models of vehicles, the name and content of their electronic control device data stream parameters are not exactly the same.

The various parameters of currently common Automotive electronic control unit data stream are classified according to different systems and types, and explain its meaning, form of parameters and the unit of numerical parameters and change range. As microcomputer of different models determined the content of their own data parameters, therefore, when detects certain vehicle model, only part of all of the following parameters will show up on the detector.

(1) General Parameters:

The so-called general parameters, are those parameters who will affect several different electronic control device of vehicle and engine simultaneously, such as engine speed, vehicle speed, work of open loop and closed-loop control system, engine load and the electronic control unit microcomputer overall output instruction status etc.. With engine speed, engine starting speed, programmable read code, speed, run time. Here are the most commonly used general parameters.

1) The Engine Speed

When reading the electronic control device data stream, the engine speed displayed on the detector is calculated by electronically controlled fuel injection system microcomputer (ECU), or vehicle power system microcomputer (PCM) according to the engine ignition signal or the pulse signal of crankshaft position sensor ,which reflects the actual speed of the engine. Units of engine speed generally adopts r / min, the change range varies from 0 to the maximum engine speed. The parameter itself has no analysis value, generally used as a reference for the analysis of other parameters.

2) Engine Starting Speed

The parameter is the engine speed driven by the starter when starting the engine, the unit is r / min, showing value range 0r/min ~ 800r/min. This parameter is the basis of engine microcomputer to control start

fuel injection quantity. In analysis of the engine speed you can analyze the reasons for being difficult to start or the starting performance of engine.

③ Working State of Oxygen Sensor

The parameter represents the concentration and dilute state of exhaust measured by oxygen sensor on the exhaust pipe of engine. Some automobile of twin tailpipes display this parameter as the left oxygen sensor working conditions and right oxygen sensor working conditions. The oxygen content of exhaust gas depends on air-fuel ratio of intake gas mixture. Oxygen sensor is the major sensor to measure the concentration and dilute state of the engine mixture. Oxygen sensor must be heated to above 300 ℃ to provide the correct signals to the computer. The engine microcomputer must be in a state of closed-loop control to respond to oxygen sensor signals.

The type of Oxygen sensor work state parameters varies according to model, some models display it in the form of state parameters, the variation is thick or thin; also some models display it in the form of numerical parameters. The number unit is mV. Thick or thin represents the overall state of the exhaust. mV, represents the output voltage of oxygen sensor. The parameters when the engine warmed up and running at medium speed (1500r/min ~ 2000r/min), presents the alternation of thick or thin or the variations of the output voltage between 100mV ~ 900mV , the change times within each 10s should be more than 8 times (0.8Hz). If the parameters change slowly or not change or values abnormal, it indicates there is failure in feedback control system of the computer oxygen sensor .

④ Open loop or closed-loop

This is a state parameter, it represents that the control way of engine microcomputer is open-loop or closed loop. Operation in the cold, it should be displayed as the open-loop state; when the engine reaches normal operating temperature and the engine microcomputer has response to the oxygen sensor signals it should be displayed as the closed-loop state.

Some fault (usually will show fault code) will have engine microcomputer return to open-loop control state. In addition, some models after in idle for some time will also return to the open-loop state, which is often because the temperature of the oxygen sensor is too low when at idle. For this, you can push the accelerator pedal down, so as to let the engine fast idle to heat oxygen sensors. If the parameter has been shown as the open-loop condition, after fast idle it still can not return to the closed-loop state, indicating oxygen sensor or the engine fuel system failure.

⑤ Speed

Speed parameter is the vehicle speed numerical value calculated by engine or automatic transmission microcomputer (ECM, TCM) according to the speed sensor signal. Speed parameter display units are miles / h or km / h.

Speed parameters are the main parameters of microcomputer controlled speed automatic transmission and

the important parameters for cruise control. Some vehicles with automatic transmission have no speed sensor, at this time the speed shown on the speed detector is 0. This parameter is generally as a reference for the analysis of other automatic transmission control parameters.

(2) Fuel Output Parameters

Fuel output parameters represent the state of engine microcomputer controlling electronic fuel injection system, and the control signal sent to actuator such as injector. There are the following.

1) The Fuel Injection Pulse Width

Injector pulse width is the length of time that engine microcomputer controls each injection of injector, is the most important indicator of whether injector is working properly. This parameter shows the fuel injection pulse width in units of ms. If the parameter displayed values large, indicates that the time of the injector every time opening fuel injection is comparatively long, the engine will get thicker mixture; if the value small, indicates that injector fuel injection opening time is short , the engine will get more dilute mixture. Injector pulse width has not fixed standards, it will change as the engine speed and load change.

2) The Target Air-fuel Ratio

This parameter is not the actual engine air-fuel ratio obtained by measuring, but air-fuel ratio to be provided calculated by the engine microcomputer in closed loop control according to various sensor signals, microcomputer would control the injector injection volume according to the size of this parameter.

The value of the parameter is generally around 14.7. Below this value represents microcomputer to offer dense mixed gas; higher than this value represents that should provide a more dilute microcomputer mixture. Some models show this parameter in way of state parameters, the content of display is thick or thin.

Such parameters are: fuel short-term correction factor, fuel long-term correction factor, fuel calibration study, the fuel calibration block; out-sync pulse, power enriched, the accelerator pedal fully open, remove the overflow; deceleration dilute, DFCO; acceleration thick, starting switch.

（3）Throttle Position and Idle Speed Control Parameters

Throttle position and idle speed control parameters reflect working condition of throttle position and various idle speed control device. Some parameters also represent the commands sent out to the engine idle speed and throttle valve control device by microcomputer. There are the following.

① Throttle Opening

This is a numeric parameter, the units of its numeric value has the following three kinds according to different models: if the unit is voltage (V), the numerical range is from 0V ~ 5V; if the unit is angle (°), the numerical range is from 0 ° ~ 100 °; if the unit is the percentage (%), the values range is from 0 to 100%.

The numeric value of this parameter represent signal values of the throttle position sensor received by the engine microcomputer or the opening size of the throttle position calculated according to signal. If its absolute value is

small, the throttle opening degree is small; if its absolute value large, then the throttle opening degree is large. In conducting numerical analysis, you should check the numerical size of parameters when the throttle all closed. In voltage units, when the throttle all closed the numeric value of parameters should be lower than 0.5V; in angle units, when the throttle all closed the parameter value should be 0 °; as percentage for the unit, when the throttle fully closed the parameter value should be 0. Should also check the value when the throttle fully open. In different units when the throttle should be fully open the values are about 4.5V; more than 82 ° or above 95%rspectively. If abnormal, it may be the throttle position sensor fault or improper adjustment, it also may be circuit or microcomputer internal fault.

②Idle Air Control

This parameter is a numeric parameter that represents the opening of idle speed control valve of the computer-controlled engine throttle body. In detection, according to different model, the parameters has two conditions: adopting percentage (%) as the ratio and not adopting, its value range is from 0 to 100%, 01 to 5 and 0 to 255. If the Value is small, indicates the opening of the idle speed control valve is small, the volume of air intake through the idle speed control valve into the engine is small; if the numerical value large, indicates the opening degree of idle speed control valve is big, the intake air through the idle speed control valve into the engine is plenty. In the numerical analysis, the control situation of microcomputer on the idle speed control valve can be monitored by observing the parameters, as a reference for judging the engine idle speed fault or other failures.

⑶Idle Switch

This is a state parameter, the display is ON or OFF. It represents idle switch signal of the throttle pedal position sensor received by microcomputer. When the accelerator pedal fully closed, the idle switch of the accelerator pedal position sensor is closed, then the parameter should be ON; after opening the throttle pedal, the parameters should be OFF. If abnormal, indicating the accelerator pedal position sensor is faulty, or line, microcomputer internal fault. Such parameters are: target idle speed, idle speed control valve position, idle stepper angle.

（4）The Engine Water Temperature and Intake Air Temperature Parameters

① Engine Water Temperature

This is a numeric parameter, the unit can be selected to be ° C or ° F by detector. when the unit is ° C, its range is -40 ℃ ~ 105 ℃. The parameter indicates the temperature values calculated by microcomputer according to signals sent by water temperature sensor. The parameter values should be able to increase gradually during the cold start of the engine to warm-up. When the engine completely hot, the idle running temperature should be 85 ℃ ~ 105 ℃. When the water temperature sensor or circuit break, the parameter appears as -40 ℃. If the displayed value exceeding 105 ℃, it indicates the water temperature sensor or circuit short circuit. In some

models, the unit of the engine temperature parameters is V, indicating that the parameter values are directly from the temperature sensor signal voltage. The proportional relations between the voltage and water temperature differs according to the way of control circuit, usually in inverse proportion relationships. Namely when water temperature is low voltage high, when water temperature is high, voltage low. But may also be directly proportional relationship. When water temperature sensor works normally, the parameter values are in the range of 0V ~ 5V.

② Starting temperature

Some models of microcomputer will save the water temperature sensor signals of the moment that just turn on the ignition switch until the next starting after turning off the engine. When conducting numerical analysis, the detector will show the signal of microcomputer data stream in the form of starting temperature; making comparisons between the parameter values and engine water temperature values to judge whether the water temperature sensor is normal. When the engine cold starting, starting temperature and the present engine water temperature values are equal. With the hot start of the engine, engine water temperature should be gradually increased, while the starting temperature remained unchanged. If the two values always maintain the same after the start, it indicates the water temperature sensor or circuit failure.

③Inlet Temperature

This is a numeric parameter, its value units are ° C or ° F, in units of ° C, the variation range is -50 ℃ ~ 85 ℃. The parameters indicated intake air temperature values calculated by microcomputer according to the intake air temperature sensor signals. When conducting numerical analysis, should check whether the value and the actual intake air temperature is consistent. Before cold starting, the parameter values should be basically the same as temperature; after cold start, along with the warming up of the engine, the parameter value should be increased gradually. If the parameter is -50 ℃, it indicates that the intake air temperature sensor or circuit open circuit; if the parameter is displayed as 105 ℃, it indicates that the intake air temperature sensor or circuit short circuit.

（5）Air Pressure and Air Inflow Parameter（Increase Pressure）

Air pressure and air inflow parameter indicates the atmospheric pressure around the car, the engine intake manifold pressure or the size of air intake. Engine microcomputer must measure these parameters to determine the engine load, and accordingly calculating the fuel injector injection quantity and spark advance angle. There are four kinds of such parameters.

① Atmospheric Pressure

This is a numeric parameter that represents the size of the signal voltage that sent by the atmospheric pressure sensor to microcomputer, or the atmospheric pressure values calculated by the microcomputer according to the signal. The units of the parameters are different for different vehicle models, and there are 3

species :V, kPa, cmHg, the variation range is 0V ~ 5.12V, 10kPa ~ 125kPa, 0cmHg ~ 100cmHg. microcomputer of some models show 2 air pressure parameters, the units are V and kPa or cmHg. These two parameters represent the size of the atmospheric pressure sensor signal voltage and the atmospheric pressure value calculated by microcomputer according to this signal. Atmospheric pressure values is related to altitude: in where near the sea level the pressure is about 100kPa, the plateau atmospheric pressure is relatively low, at an altitude of 4000m is about 60kPa. In the numerical analysis, if the parameters are found to have great deviation from the ambient air pressure, then it indicates the atmospheric pressure sensor or microcomputer failure.

② Intake Manifold Pressure

This is a numeric parameter, representing that the signal voltage sent by intake manifold pressure sensor to microcomputer, or the intake manifold pressure value calculated by microcomputer according to the signal voltage. The unit of the parameter varies according to model, but also 3 species :V, kPa, cmHg, the variation range is 0V ~ 5.1V, 0kPa ~ 205kPa and 0cmHg ~ 150cmHg. The pressure measured by intake manifold pressure sensor is the absolute pressure of the intake manifold behind the engine throttle. When the engine running the pressure depends on the opening of the throttle and engine speed. At the same speed, the smaller the throttle opening, the lower the intake manifold pressure (that is, the greater the vacuum); in the same throttle opening, the higher the engine speed, the lower the pressure. Turbocharged engine intake manifold pressure is greater than 102kPa (atmospheric pressure) when the turbocharger work. In flameout condition, intake manifold pressure should be equal to atmospheric pressure, the parameter values should be 100kPa ~ 102kPa. In numerical analysis if the parameter value and the engine intake manifold absolute pressure does not match, it indicates the sensor is abnormal or microcomputer failure.

③ Air Mass Flow

This is a numeric parameter, it represents the air intake signal that engine microcomputer received from air flowmeter. Change range of the value and units of the parameter depend on the vehicle model and the type of air flowmeter.

Vehicles with wing plate-type air flow meter, hot-wire type air flow meter and hot-film air mass meter , whose units of the value of the parameter are V, the change range is 0V ~ 5V. In most models, the size of this parameter is inversely proportional to the quantity of air intake, namely, the quantity of intake air increases, the output voltage of air flowmeter drops, the value of the parameter decreases too. 5V indicates that there is no intake air; 0V indicates the maximum. In some models the size of the parameters is proportional to the quantity of intake air, that is, the value is large, then the quantity of intake air is large, and vice versa.

Vehicles with Vortex-type air flowmeter, the units of value of their parameters are Hz or ms, the change range is 0Hz ~ 1600Hz or 0ms ~ 625ms.At idle, engine of different delivery capacity, the value of the parameter is 25Hz ~ 50Hz.The greater the quantity of the intake air, the larger the value of the parameter. When at 2000r/min its value is 70Hz ~ 100Hz. If in different working conditions the parameter value remains unchanged or are greatly different from standards, indicating the air flow meter malfunction.

(6) Electrical and Ignition Parameters

Electrical and ignition parameters presents automotive electrical system status, it also includes input signal sent by ignition system to microcomputer and control signal output by microcomputer to ignition system. There are mainly following kinds.

① Battery Voltage

This is a numeric parameter, it reflects automotive battery voltage detected by microcomputer, its numerical change range is 0 ~ 25, unit is v. Engine microcomputer control system has no sensor specialized for detecting battery voltage, microcomputer obtained this value through the test of its internal circuit to the power voltage that input to microcomputer. When the engine running the actual numerical value of this parameter usually close to the normal charge voltage, when at idle it is about 13.5V ~ 14.5V. In numerical analysis, can make comparison between the numerical value of the parameter and voltage on battery terminal. If voltage too low, indicates microcomputer power lines have fault.

This parameter is mainly used for microcomputer self-diagnosis. When the battery voltage is too high or too low, some functions of microcomputer will change. For example: If the microcomputer found the voltage drops below the limit, it will send commands to the engine to run at fast idle, to increase the charging capacity. This will exert an effect on idle speed control, fuel control and ignition timing parameters. In most models, if the microcomputer found that the battery voltage is too high, it will cut off current of all solenoid valves controlled by the microcomputer to prevent microcomputer damaging due to excessive current.

② 5V Reference Voltage

This is a numeric parameter, representing the value of the reference working voltage output by microcomputer to some sensors, which ranges from 0 to 5.1, unit is V. The reference voltage of microcomputer of most vehicles are around 5.0V. The voltage is the fundamental standard for measuring whether microcomputer work normally. If the voltage is abnormal, indicates microcomputer fault.

③ Spark Advance Angle

This is a numeric parameter, it represents the total ignition advance angle controlled by the microcomputer (including the basic ignition advance angle), the variation range is -90 ° ~ 90 °. In the course of engine operation, the parameter values depends on the engine operating conditions and the relevant sensor signal, usually varies between 10 ° ~ 60 °. In numerical analysis, should check the parameter whether varies with the different engine operating conditions. Usually when the engine is idle the parameter is about 15 °; when the engine is accelerating or running at a high speed, the parameter increases. If the parameters remain unchanged in different engine conditions, it indicates microcomputer fault. The timing light can also be used to detect the actual value of the engine spark advance angle, and comparing this value with the parameter, if actual spark advance angle and the parameter does not match, indicating the installation location of crankshaft position sensor is incorrect, you should check and adjust by following the rules.

④ Starting Signal

This is a state parameter, the display is YES and NO. This parameter reflects the location of the ignition

switch detected by the microcomputer or whether connected when starter circuit starting. When the ignition switch turn to start position, starter circuit connected and operating, the parameters should be shown as YES, under other circumstances is NO. The engine microcomputer according to this signal to determine whether the engine is in start state, and thus to control the fuel injection when the engine start, idle and ignition timing. In numerical analysis, should check the parameters whether shown as YES when the engine starts. If the parameter is still displayed as NO when starts, indicating the signal circuit from starting system to microcomputer has fault, which causes failures such as difficulty in starting the engine.

⑤ Ignition Control

This is a state parameter, the display content is YES or NO. The parameter represents that whether the engine microcomputer controls the ignition advance angle. Usually in the engine starting process, the ignition timing controlled by the ignition electronic components, engine microcomputer without ignition advance angle control, then the parameter is displayed as NO; after started and the engine microcomputer controls ignition timing, at this time the parameter display as YES. If the parameter display as NO during the operation of the engine, indicating some of the sensors in control system malfunction, the engine microcomputer can not control the ignition advance angle.

⑥ Knock

This is a state parameter, the display content is YES or NO. The parameter represents that whether microcomputer received Knock signal sent from Knock Sensor. When the parameter is displayed as YES, indicating ECU received knock signal; when displayed as NO, indicating that microcomputer did not receive knock signal. When conducting numerical analysis, can accelerate urgently in the operation of engine, then the parameter should be firstly displayed as YES, then NO. If the parameter is not displayed as YES when anxious acceleration or is also shown as YES when running at constant speed, indicating knock sensor or circuit malfunction.

⑦ Knock Count

This is a numeric parameter, which ranges from 0 to 255. It represents the number of knock and related duration time calculated by microcomputer according to the knock sensor signal. Parameter values are not the actual number and time of knock, it is just a relative value that is proportional to the number and duration time of the knock. Any value greater than 0 indicates that knock has occurred. The value low indicates the times of knock is few or duration time short, high value indicates the times of knock is multiple or duration time long.

⑧Knock Delay

This is a numeric parameter, which ranges from 0 to 99. It indicates the value that microcomputer delayed ignition advance angle after receiving the knock signal sent by knock sensor, the unit is degrees (°). The parameter values do not represent the actual ignition advance angle value, merely indicating the delayed angle of ignition advance angle compared to the best spark advance angle in the current operating conditions.

⑨ Electrical Load Switch

This is a state parameter, the display content is ON and OFF. The parameter represents load conditions of vehicle electrical system. When using headlights, brake lights, rear window defroster, air conditioning and other large electrical equipments, the parameter is displayed as ON; when all the attached electrical equipment turned off, the parameter is displayed as OFF. Engine control system uses this parameter when at idle speed to compensate for charging system (such as increasing the engine idle speed). To increase the alternator's generating capacity.

(7), Emission Control Parameters

Emission control parameters indicates the input and output signals among all sensors, actuators, and microcomputer of vehicle emission device that controlled by microcomputer, these emission devices including exhaust gas recirculation, air injection systems etc..

① Canister instructions

It's a state parameter, the display content is ON or OFF. It represents the control signal that output from microcomputer to charcoal canister-purge valve. Microcomputer closed the solenoid valve in cold or idle, cutting off the vacuum channel from the engine intake manifold to charcoal canister, to stop the purification and recovery work of charcoal canister, then the parameter displays as OFF. When the engine warming up and operating at a speed higher than idle speed, the microcomputer let the solenoid valve open, connecting the vacuum channel from canister to the engine intake manifold, then the parameter is displayed as ON. If in the numerical analysis the display law of the parameters were found to be abnormal, indicating microcomputer or some sensor malfunction.

② EGR commands

This is a state parameter, the display content is ON or OFF. The parameter represents that whether microcomputer output control signals to let the exhaust gas recirculation control valve open. When this parameter displayed as ON, indicating that the microcomputer output control signals, exhaust gas recirculation control valve receives the signal channel, open vacuum channel to let the vacuum into the exhaust gas recirculation valve, to have the exhaust gas recirculation device start working. This parameter appears as OFF, the solenoid valve is not power on, cut off the vacuum of the exhaust gas recirculation valve. The parameters is displayed as OFF when the vehicle parking or the engine at idle, open-loop control state, usually shown as On when the vehicle driving. This parameter simply reflects whether the microcomputer has output control signals, it does not indicate whether the EGR control solenoid valve receives the signal and is turned on.

③ EGR Temperature

This is a numeric parameter, which ranges from 0 to 5.12 (in V) or -50 to 320 (in ℃). The parameter indicates that feedback signal transmitted from the exhaust gas recirculation temperature sensor installed on

the EGR access to the microcomputer, the signal in the form of temperature changes indirectly reflects the flow of exhaust gas recirculation. When the exhaust gas recirculation flow is large, the exhaust temperature of the exhaust gas recirculation path increases, the value of this parameter increases; when exhaust gas recirculation flow is small or stop, the parameter value decreases. In the numerical analysis, you can compare the parameters with exhaust gas recirculation control commands. When the exhaust gas recirculation command parameter is ON, the exhaust gas recirculation temperature value should increase, otherwise it indicates that the exhaust gas recirculation device does not work or exhaust gas recirculation temperature sensor malfunction.

④ Air Injection Commands

This is a state parameter, the display content is NORM or DIV. The parameter represents the commands sent out from engine microcomputer to air injection system. When the parameter is displayed as NORM, it indicates that microcomputer output control signals to the solenoid valve to have solenoid valve move the air injection valve, to allow air to spurt exhaust valve or exhaust manifold; when the parameter is DIV, indicating that microcomputer control valve move the valve gate, to spurt air towards atmosphere or three way catalytic reactor.

(8), Drive system, electronically controlled automatic transmission, and other comprehensive parameters

Drive system and electronically controlled automatic transmission parameters represents the instructions sent from microcomputer to all actuators of the transmission and signals from all sensors of the transmission and drive system, including: lock-up clutch instruction, parking neutral position switch, pulse generator, speed, overdrive gear switch. Other comprehensive parameters such as: power steering pressure switch, engine load, air-conditioning parameters etc

4.5 Data Stream Study and Comparison Function

Data stream study function can realize the automatic learn for the data parameters during the normal operation of vehicles, and save, compare to other vehicles whether their relevant data is abnormal, it helps the users to have a scientific management and accurate judgment for these operating parameters of various vehicle models, so that can improve the user's vehicle repair and maintenance skills effectively and quickly.

4.5.1 Data Stream Study

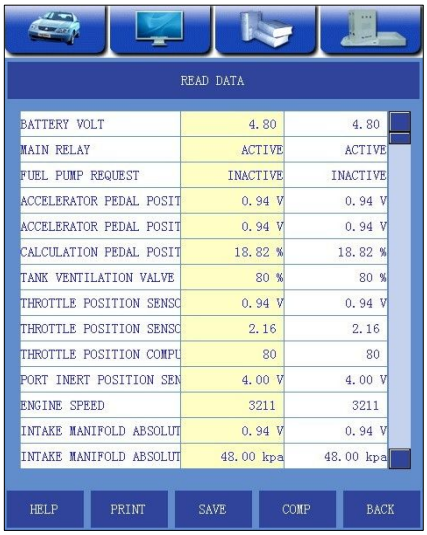

READ DATA
BATTERY VOLT 4.80 4.80
MAIN RELAY ACTIVE ACTIVE
FUEL PUMP REQUEST INACTIVE INACTIVE
ACCELERATOR PEDAL POSIT 0.94 V 0.94 V
ACCELERATOR PEDAL POSIT 0.94 V 0.94 V
CALCULATION PEDAL POSIT 18.82 % 18.82 %
TANK VENTILATION VALVE 80 % 80 %
THROTTLE POSITION SENSO 0.94 V 0.94 V
THROTTLE POSITION SENSO 2.16 2.16
THROTTLE POSITION COMPU 80 80
PORT INERT POSITION SEN 4.00 V 4.00 V
ENGINE SPEED 3211 3211
INTAKE MANIFOLD ABSOLUT 0.94 V 0.94 V
INTAKE MANIFOLD ABSOLUT 48.00 kpa 48.00 kpa
HELP
PRINT
SAVE
COMP
BACK

Figure 4.5.1

When reading the vehicle data you can Click【Save】button in the bottom of the screen to save the dynamic data. As shown in Figure 4.5.1 And name the saving data stream by keyboard（It is better to name after diagnostic vehicle's model or year for the convenience of reference. Click【Confirm】and it wll prompts save success.

Note: you 'd better select a vehicle in good condition to collect the data.

4.5.2 Data Stream Comparison

Make Comparison and inspection betwen historical data and the current dynamic data stream, as shown in Figure 4.5.1

Click【Comparison】button in the bottom of the screen when reading out data. and Save readout dynamic data in popup window.

4.5.3 Data Stream Save and Delete

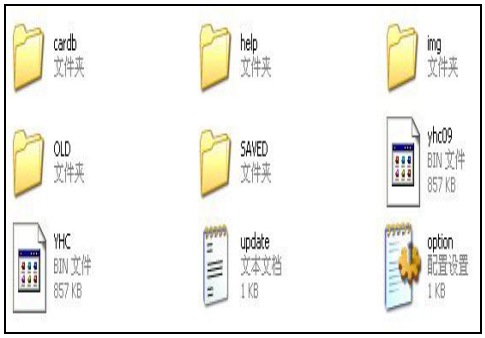


Figure 4.5.3

User self-study data stream will autosave in【SAVED】folder of Sd Card, as shown in Figure 4.5.3 and pls save this folder to the physical HD of your PC to avoid data stream missing. Format SD card before upgrade, After finishing the upgrade, put back the folder to SD card to recover normal data stream. If no need save the data stream, you can format SD card directly.

5. Register, Activation, Download and Upgrade of Diagnostic Software

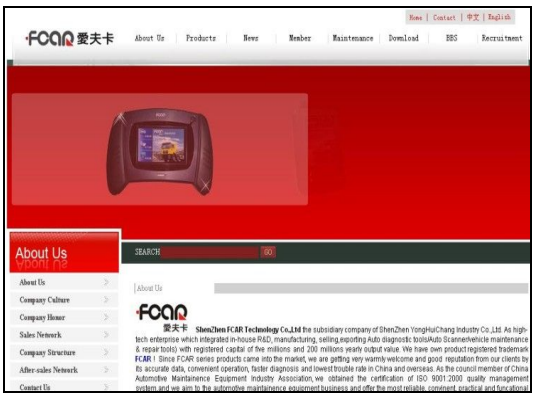


Figure 5.1A

5.1 User Account Register, Activation and Upgrade

Note: Take FCAR-F3-W edition as an example. Others models is same with it.

Open website homepage http://www. fcar.com, you as shown in Figure5.1A。

Figure 5.1B

If you have registered for your product, you can login directly. See【Figure 5.1B】。

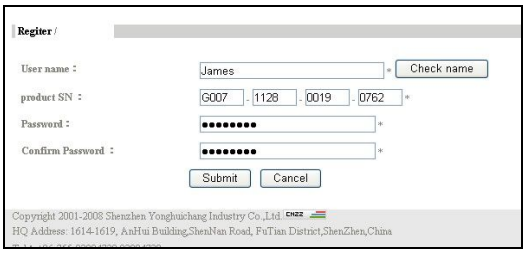


Figure5.1C

If you haven't registered for your product to be our member. Pls click Figure5.1B 【Register】button, there is a new page to apply new user registration. See【Figure 5.1C】. Then input relevant information and the correct FCAR Main Unit SN(the SN is attached in the back of Main Unit or on the warranty card、Certificate of Approval), when you finish the input, pls click【Register】button as shown in Figure5.1C.

Figure 5.1D

If registered successfully, the Menber Center will show your registered user name and password as shown in Figure 5.1D.

Note: The newly registered user name and password must be saved, for they are the only ID verification code to login Download Center to download the software.

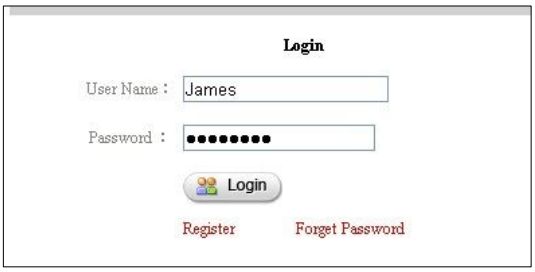


Figure 5.1E

Back to FCAR website to login directly with your user name and password as shown in Figure 5.1E

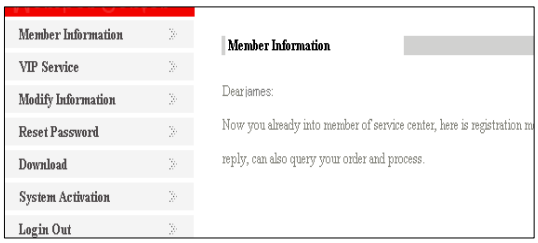


Figure 5.1F

Click 【Login】, the page will show as【Figure5.1F】.

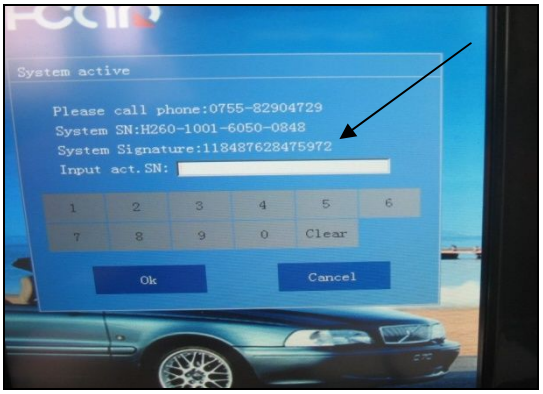


Figure 5.1G

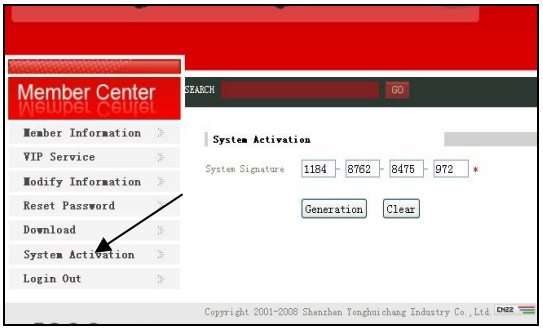


Figure 5.1H

Figure 5.1 I

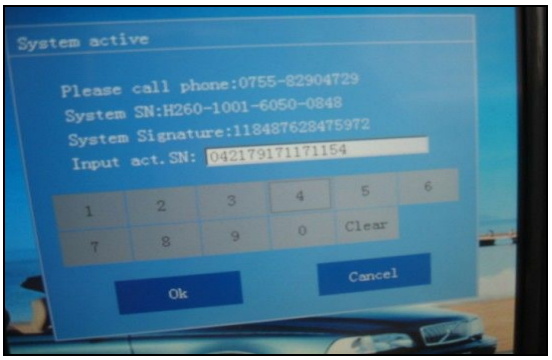


Figure 5.1J

· System activation:

Normally when customer received the product, the screen will pop up “You have ** times use” .Customer need do the system activation to use without any times limitation.

Method 1 – From FCAR Website to active by yourself.

Method 2 – Send to FCAR company to active by the email.

Method 1 :

1) Turn On your Main unit. Open the system activation menu. You will see the system Signature as shown Figure 5.1G

2) Open the FCAR company website and login in the member. Click System Activation in the left side of page, and input the System Signature of Main Unit. As shown in Figure 5.1H

3) Click the button “ Generation” , the page will popup the ACT SN. As shown in Figure 5.1 I

4) INPut the ACT. SN in the Main Unit As shown in Figure 5.1 J

5) Then Click the button “OK” , will popup activation success as shown in Figure 5.1 K

6) After activation success, you can use again. If you don’t need use the product, Pls Turn Off the Main Unit.

Figure 5.1 K

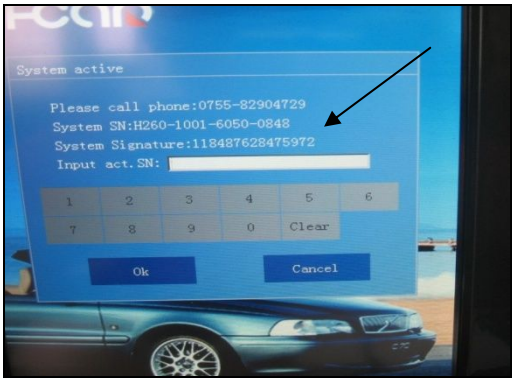


Figure 5.1 L

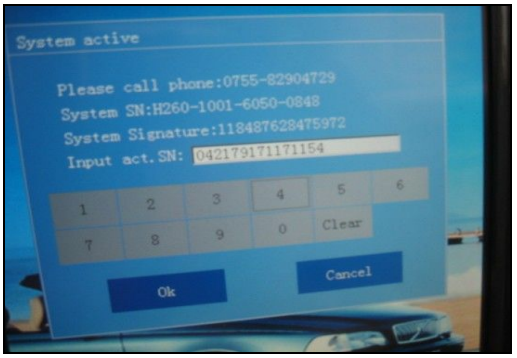


Figure 5.1 M

Method 2 – Send to FCAR company to active by the email.

1) Turn On your Main Unit , and Open the System Activation Menu. You will see the System signature (Figure 5.1 L) , Pls send this number to FCAR company by email/Call, Then FCAR people will answer to you the " ACT. SN " number, such as the ACT SN is : 042179171171154 , after you receiving the number, Pls input it in the Main Unit.(Figure 5.1 M).

2) Then click button "OK" to active. Will popup the activation success. Then Turn off the Main Unit if don't use!!

NOTE: All operations will be finished in one time. During the activation, if you turn off the Main unit, Main unit will get a new system signature in the Activation menu. you can input the new system signature in the website to generate a new ACT SN to reactive again. In addition, don't keep the Main Unit always on powering for long time.

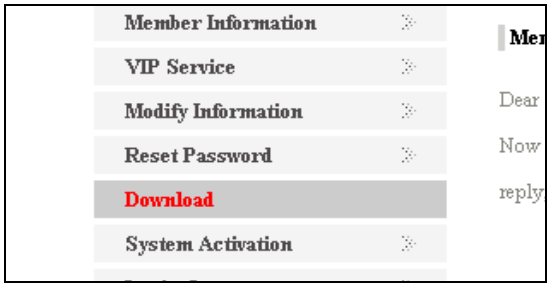


Figure 5.2A

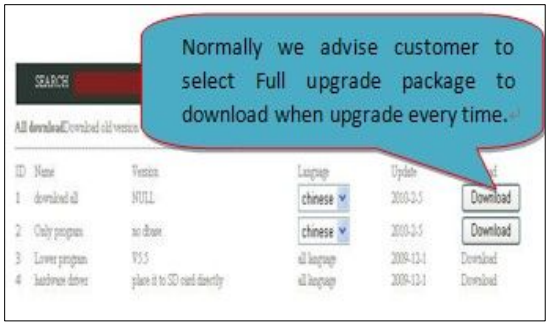


Figure 5.2B

Figure 5.2C

File Download - Security Warning
Do you want to run or save this file?
Name: update-2010913-2554.exe
Type: Application, 20.8MB
From: www.szfcar.com
Run
Save
Cancel
While files from the Internet can be useful, this file type can potentially harm your computer. If you do not trust the source, do not run or save this software. What's the risk?

Figure 5.2D

5.2 Download of Diagnostic Software

Click 【Download】in the left of the website after login in. See【Figure 5.2A】

FCAR Trouble Diagnostic program download have the Full data package and Individual Vehicle Database download (the download method of them are the same), But FCAR advice select the full data package to download every time to avoid any problem in the process of upgrade. Of course, you also can select the single one and program version to download..

ON LINE 1, select language you needed and click Download directly for the full data package download. See【Figure5.2B】

Click【Download】, the page will be shown as 5.2C.

Click【Here】download upgrade procedure. The download window will pop up and click 【Save】as shown in Figure 5.2D.

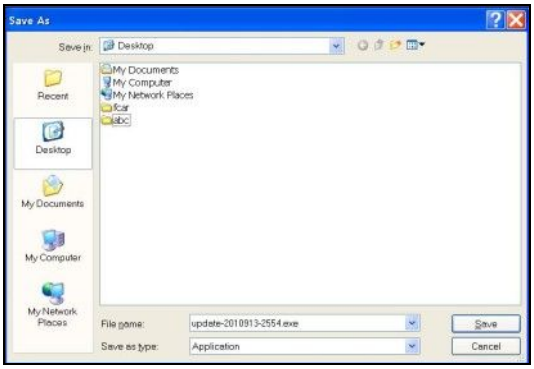


Figure 5.2E

Select the disc where you want to save, (remember the saved location) normally keep it on the desktop. Click 【Save】button. See【Figure 5.2E】

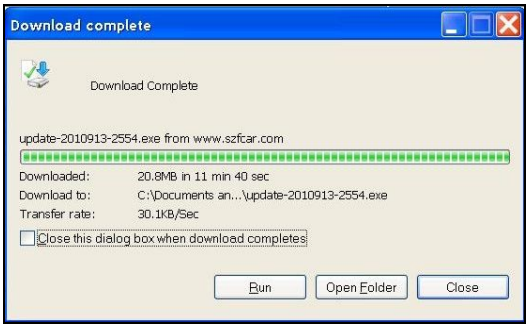


Figure 5.2F

Click【Close】button when download finished, See【Figure 5.2F】.

5.3 The Connection of SD Card

Figure 5.3A

Take out the SD card from FCAR Main Unit. See【Figure5.3A】.

Figure 5.3B

Take out the SD card reader/writer from FCAR instrument container (subject to the real object). See【Figure 5.3B】.

Figure 5.3C

Insert SD card into the SD card reader/writer (take note the direction） as shown in Figure5.3C.

Note: The wrong direction can lead to SD card and reader damage.

Figure 5.3D

Then insert the SD card reader/writer with SD card attached into USB port of PC. See【Figure5.3D】.

Figure 5.3E

Select 【My computer】in the desktop of Windows and dblclick. See【Figure 5.3E】.

After opening my computer it will show removable disc, as shown in figure 5.3F.

Figure 5.3F

Precaution on operation of the SD card

1） Don’t pull out the SD card when the SD reader/writer card is being used. 2）Don’t Insert or Pull out SD card when FCAR Main Unit is turned on to avoid sd card damage or sd card data loss. 3）Don’t format SD card frequently to avoid the damage of SD card data storage chip. 4）Don’t put SD card in a strong magnetic field to avoid Sd card data loss. 5） Don’t touch any mordant chemical product to avoid the damage of SD card meta pin.

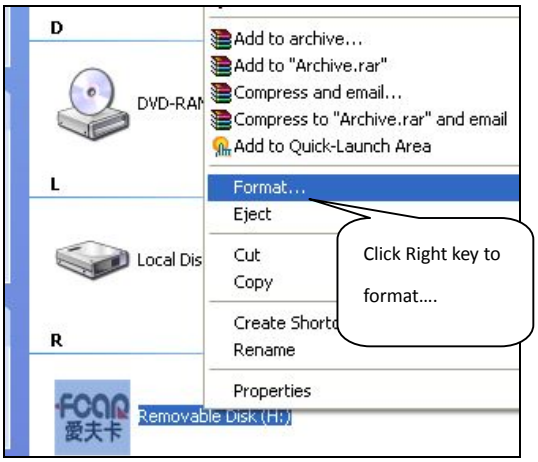


Figure 5.4A

5.4 Diagnostic Software Upgrade

Following the step of 【5.3 the connection of SD card】and connect successfully, then select the removable disk of FCAR SD Card on My computer and click right key of mouse, select 【Format】, if your download interface haven't popped the hint of the format, it is available to upgrade directly without format. See【Figure5.4A】,

Format Removable Disk (H:)
WARNING: Formatting will erase ALL data on this disk.
To format the disk, click OK. To quit, click CANCEL.
OK
Cancel

Figure 5.4B

Select Quick Format, then Select【Start】, it will pop-up a warning window, Click【Confirm】to format SDCard. See【Figure5.4B】.

Figure5.4C

After finished format, Click【Confirm】 See【Figure5.4C】.

Figure5.4D

Select the upgrade program just now you downloaded on the desktop, and dblclick it

.Click【Run】,Confirm to start running

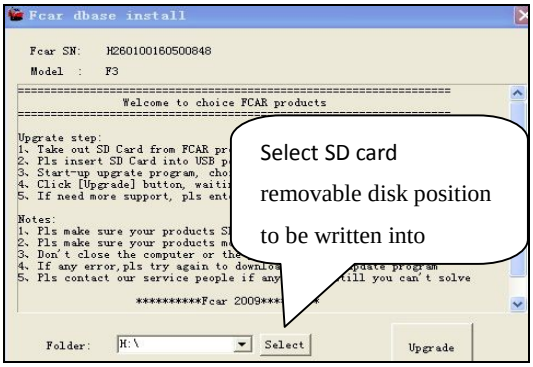


Figure5.4E

The FCAR F3-W product upgrade tool will be shown on the desktop. Click【Upgrade】,the program will be written into SD card, as shown in Figure 5.4E

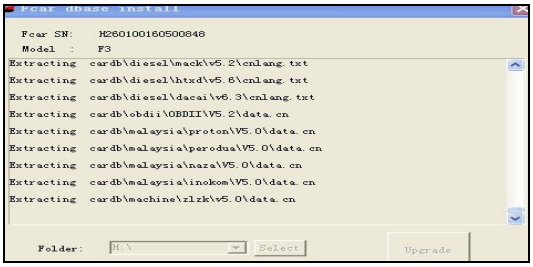


Figure 5.4F

It maybe take several minutes, Pls be patient. See 【Figure 5.4F】

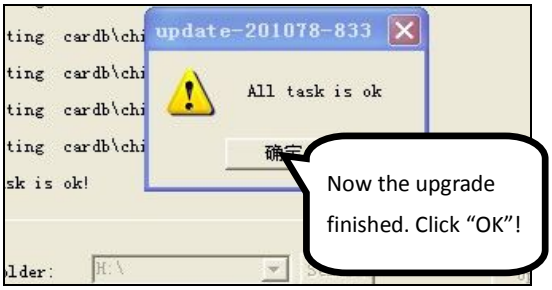


Figure 5.4G

Click【Confirm】to finish all upgrade steps. See 【Figure5.4G】.

Figure 5.5A

Figure 5.5B

Hardware Upgrade of Main Unit

Hardware version too low of the machine will lead to mismatch with the upgraded program, so the hardware is required to update. Return to All Download; click “Download” behind “Hardware Version” As shown in Pic.6.4.1.

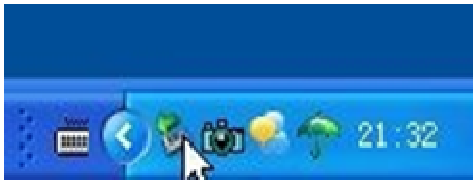
Click “Save”, as shown in Pic.6.4.2.

At this time,it will popup option about save location, select the inserted SD card disc, as shown in Pic.6.4.3.

After select SD card disc, then click “Save”, if prompts whether need to replace program already have, click “Yes”, as shown in Pic.6.4.4.

Note: When downloaded the Hardware version into SD card, it will prompt “Found new application program, whether need to update”, Select “Yes”,I will prompt “Hardware update success” after update successfully.

5.6 The Exit Step of SD Card



After software upgrade to the SD card successfully, you need to exit SD card from the computer, specific operation methods are as follows:

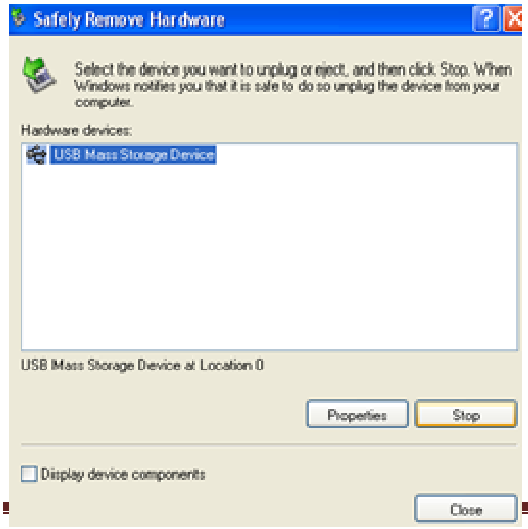
1. In the activity icon bar of the button right corner of computer screen, select removable hardware icon, as shown in Pic. 6.5.1.

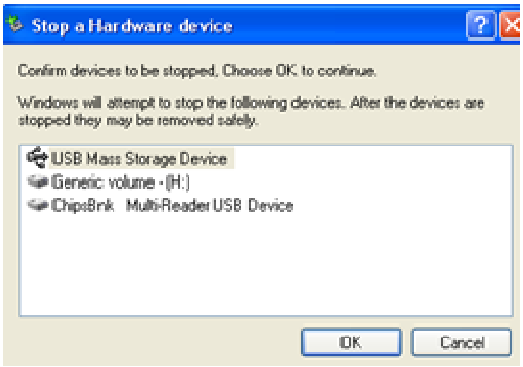
2. Click the right key of the mouse, select the【Safely Remove Hardware】in the pop-up dialog box, as shown in Pic. 6.5.2.

3. In the pop-up dialog box, click【Stop】 button to stop the computer attaching removable storage device (FCAR SD card), as shown in Pic.6.5.3

.

P


Safely Remove Hardware
Select the device you want to unplug or eject, and then click Stop. When Windows notifies you that it is safe to do so unplug the device from your computer.
Hardware devices:
USB Mass Storage Device
USB IMass Storage Device at Location 0
Properties
Stop
Display device components
Close


Stop a Hardware device
Confirm devices to be stopped, Choose OK to continue.
Windows will attempt to stop the following devices. After the devices are stopped they may be removed safely.
USB Mass Storage Device
Generic volume - (H:)
ChipsBnk Multi-Reader USB Device
OK
Cancel

Pic.6.5.4

4. In the upper left side of the pop-up dialog box, select the USB device currently needed to stop, click on 【OK】, as shown in Pic.6.5.4, the computer system will conduct data separation on the USB device that need to stop.

Pic.6.5.5

5. After Computer finished data separation on removable devices (FCAR SD card), activity icon bar in the lower right corner of the computer display screen will pop up【Safely Remove Hardware】dialog box. As shown in Pic.6.5.5.

6. Unplug the Fcar reader that inserted with SD card from the computer USB interface, as shown in Pic.6.5.5, to remove the SD card from the reader.

7. Insert upgraded SD card to Fcar F3-W main unit, the upgrade has finished.

Note: If don't follow this operation method, can cause loss of SD card data. When the upgraded SD installed to Fcar main unit, can cause system unable to work.

The operation method in this chapter, you can directly click the link below to watch.

http://www.fcar.com/en/video?id=14

6. FAQ

6.1 Questions related to Main Unit Operation

6.1.1 Power can't be Turned On After Connecting Vehicle Diagnostic Socket?

Possible Cause: Check whether the diagnostic port have 12V power supply voltage; whether the connection between diagnostic main cable and connector of main unit is ok; check whether vehicle battery voltage is higher than 10V; whether main cable diagnostic connector have any damage or breakdown etc.

Solution: Check vehicle system voltage and main cable diagnostic connector.

6.1.2 Screen Doesn't Display Except Backlight After Startup

Possible Cause: the power connection don't touch well

Solution: ShutDown and repeat Pluging/Unpluging the power supplier, StartUp again after 1 second.

6.1.3 Screen Displayed Abnormally After StartUp

Possible Cause:SDCard isn't inserted well;SD card program damage; Supply voltage is too low

Solution: Take out SD card and insert again; Download SD card upgrade program: Checking the supply voltage

6.1.4 Screen Displayed "SD Card Can't Be Detected" After Startup

Possible Cause: SDCard is dirty with oil, or oxidation, also damage by upgrade incorrectly.

Solution: Wipe SD Card in a little alcohol with cotton tipped applicator; Change new SD Card

6.1.5 Screen Flickers or Not Enough Bright After Startup

Possible Cause: Vehicle power voltage is not stable or the voltage is too low, the supply is not enough for the main unit.

Solution: Check the Battery power and circuit.。

6.1.6 Can't Input Data After Opening Soft Keyboard

Possible Cause: Touch screen is not accurate to adjust; the cursor location where is not editing.

Solution: Adjust the touch screen again; Use the touch pen to click the editing part, if the cursor is flickering, means it is editing

6.1.7 Screen Doesn't Respond or Responds Wrongly When Touch Stylus Click

Possible Cause: The touch screen need adjust again（Note: you need adjust the screen after SD card upgrade every time）

Solution: the detail information Ref: "3.4 Screen Adjustment"

6.1.8 The Tested Result Can't be Printed Out or Printed Unclearly

Possible Cause: Lack of the print paper; Mounting paper incorrectly or reversely;

Solution: Update the high quality heat sensitive paper and take out the paper and mount it again.

6.1.9 Unable To Enter The Failure Diagnosis Program

Possible Cause: SD Card internal program failure;SD Damage

Solution: Upgrade SD Card diagnostic program again; Change SD Card

6.1.10 Displayed "Authorization Doc.Error, Pls Contact Dealer" When Diagnose

Possible Cause: The SN in SD Card and Main Unit are not matched

Solution: Download the relevant main unit diagnostic program, and make sure the correct software upgrade following the operation instruction.

6.2 Questions Related to Vehicle Diagnosis

6.2.1 Split Second Screen Flickers During Engine Starting

Possible Cause: Effected by electromagnetism,or the battery voltage fluctuate is large when Startup vehicles.

Solution: it is the normal phenomena（just try to avoid power on when start the engine）

6.2.2 Operation Interrupted During Diagnosis

Possible Cause: Effected by electromagnetism,or the connector to the socket is not tight

Solution: Depart from engine compartment with strong electromagnetism environment, turn off the high-power acoustics, check main unit connector..

6.2.3 There Is No Response From Vehicle ECU at Communication

Possible Cause: Supply power voltage is out of the normal range; the Throttle Valve is not closed, Transmission is in "D"; Turn on by electrical appliances, Water temperature is out of the normal range

Solution: Inspect the supply power voltage, close the throttle valve;put the transmission in "P";Turn off the electrical appliances, make sure the water temperature is in normal range.

6.2.4 Some Systems Can't Be Diagnosed

Possible Cause:Few system diagnostic sockets in the forepart vehicles are separated.

Solution: Pls Ref.the vehcile user manual.

6.2.5 No Trouble Code is Found

Possible Cause: Usually for the third part trouble code of common circuit.

Solution: Search the most similar touble code and the circuit to analyse.

6.3 Questions Related to Website Login, Doc.Upgrade,Download

6.3.1 Can't Open FCAR Website

Possible Cause: System maintenance; Internet connection problem, IE browser fault or firewall reject etc..
Solution: try to open after several hours; Change the internet, restore computer system,close the firewall.

6.3.2 User Account Can't Logon

Possible Cause: User name or password is wrong; local internet problem; IE browser fault Solution: Call FCAR to get back password; change other internet; restore computer system.

6.3.3 Diagnostic Program Can't Be Downloaded Successfully

Possible Cause: System IE browser fault; download software don't support; Virus Fault.

Solution: Restore computer system, install or download others software

6.3.4 FCAR Website Is Slow When Open and Logon

Possible Cause: System IE browser fault; download software don't support; Virus Fault.

Solution: Change others internet; restore computer system.

6.3.5 "Individually Vehicle DataBase" Update Whether Need Format SD Card

It is no need to format SD Card. Just check upgrade software whether is right.

6.3.6 Screen Popped "Separation/Extracting Module Failed" While Opening Update Program, Update Unsuccessfully.

Possible Cause: you cut off the operation in the process of main unit upgrade, then it will popup the hint when upgrade again.

Solution: Restart the computer.

6.3.7 Screen Indicated " Please Install msxml 4.0 SP2 program " While Upgrading

SD Card

Possible Cause: the first time to run the upgrade program.

Solution: You can download from the internet “msxml 4.0 SP2 program” and install in your computer, then upgrade.

6.3.8 Screen Displayed “Can’t Find Application Program, Error Code 0 !”

Possible Cause: there is no program in SD Card

Solution: Download the program to upgrade

6.4 How to Select Diagnostic System of Domestic Vehicles

Solution: As there are various models and brands in china, engine electronic control systems can be domestic independently developed, or from joint ventures, import. Because the difference of the brands and the technology capabilities of each vehicle manufacturers, domestic vehicle engine management system can be divided into combined electronic control system, DELPHI electronic control system, MARELI electronic control system, SIMENS electronic control system, MOTOROLA, BOSCH etc.. Just Delphi's electronic control system has not less than 10 species. The wrong choice of the system will cause auto fault diagnostic computer unable to communicate with the control unit, false fault, inaccurate fault code inaccurate data stream, misplaced data stream display, etc. problem. Diagnosing the vehicle assembled with such electronic control system should pay attention to the following questions:

1) Vehicle model match with auto fault diagnostic software.
2) The control unit type match with diagnostic software.
3) The control unit model match with diagnostic software.
4) Diagnostic seat match with fault diagnostic connector.

Note: when diagnose the vehicle models that not for sure about the above conditions, only by entering into the system successively and observing the accuracy of data streams to judge whether choose the right electronic control system, or pull out the corresponding sensor actuator, checking whether the fault code of the vehicle fault decoder associated with the pulled out components, to judge whether the system is the right choice

7. Warrant Clause

Warrant clause

Dear Fcar users, welcome to choose Fcar F3-W products. In order to better use of the product, we recommend that you should maintain your product well, and operate in accordance with user manual's instructions in each use. If your use meet this requirement, your product will be able to provide you longer-term services.

1、 In line with the following terms and conditions. And under the premise that you have bought Product and register in the website of Shenzhen FCAR Technology Co., Ltd. (hereinafter referred to as "FCAR Technology"), if there are defect in materials or workmanship of hardware, Fcar technology will provide free product warranty services by our distributor.

2、 Confirm that you have carefully read the product warrant clause, otherwise as Fcar Technology registered your mailed warranty card stub , you will be considered as agreeing to and accepting the terms of this warrant clause.

3、 Your product must be purchased from product dealer that authorized by FCAR Technology. To purchase products through the non-normal channels, buyers have to take the cost of product maintenance services and so on and can't get the warranty by FCAR Technology.

4、 The following items of products: items that are easy to wear and tear such as product instructions, inner and outer package box, attached power supply, promotional giveaways, SD card, card reader, touch pen, printing supplies etc. are not under warranty range

5、Products from the date of purchase (with valid purchase proof and effective warranty card of the product), if the products occurred the non-human damaged performance failure, you can choose repair or replace the product of the same model within a month. You can enjoy one year warranty service of Main unit, excluding non-human damage and incorrect operation.

6、Products in any of the following case, will not be able to enjoy free warranty service:

1) Failure, defect or flaw that not belong to the quality of Fcar Technology products : including your use of the product not according to the product instruction, improper operation of the product, crash, fall, disassembly by yourself, connection of improper accessories, damage owing to crash because of improper transport or storage of the product, the erosion and corrosion, etc. that caused by infiltration of liquid or food.

2) The natural wear and tear of product: including but not limited to cover, keypad, LCD touch screens, accessories etc..

3) Product main unit serial number and warranty card product serial number does not match, product quality inspection tag or bar code removed, altered or damaged.

4) Maintenance and modification without the approval of Fcar Technology or FCAR distributor

7、The product quality problem or failure occurred within the warranty period, you can take the following measures:

1) You can inspect product by yourself based on products help information. If there are no hardware quality problems, try to upgrade the product program.

2) You can dial FCAR Technology local distributor to obtain the correct service information.

8、In the process of product warranty, you can contact with local Fcar Technology designated distributor and responsible to delivery or ship to the location.

9、Enjoying your free warranty service under this warrant clause is the only measure for the losses due to product defect within the product warranty period. Fcar technology shall not be liable for your direct or indirect loss.

10、All product warranty information, product features and specification changes will be posted on Fcar Technology latest promotional materials and Web site without further notice.

Shenzhen Fcar Technology Co., Ltd. After-sales Service Department
Postcode：518111
Service hotline：0755—82904730
Fax： 0755—89687605
Website： www.fcar.com

8. Common Diagnostic Socket Position

GM

- GM BUICK GL8, the diagnostic socket is located in the lower left of dashboard,16PIN with [OBD II-16] testing connector.

- GM BUICK, under the dashboard，near the steering column,16PI,with [OBDII-16] testing connector.

- GM Sail，in the fuse box on the lower left of driving cab dashboard ,it can be seen after removing the fuse box cover,16 PIN, with [OBDII-16] testing connector.

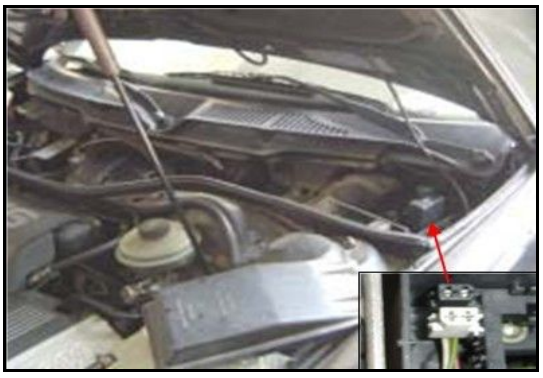
Volkswagen

- VW Passat B5, behind gear lever, beside brake lever. 16PIN with OBD II-16] testing connector.

➢ VW Polo, under the dashboard,. 16PIN with [OBD II-16] testing connector.

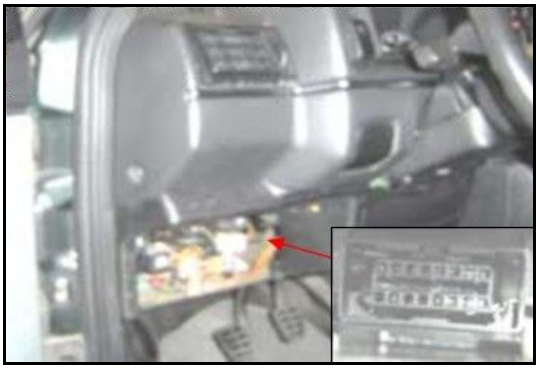
➢ VW Santana， under gear lever dustcover, 16PIN with [OBD II-16] connector.

➢ AUDI A6, on the lower left of instrument, 16PIN ,[OBD II-16] connector



➢ AUDI 100 2.6E, the left rear of Engine compartment, 4PIN,[AUDI-4]connector.

➢ VW New Bora,1.8,under the center console, 16PIN. [OBD II-16]connector.

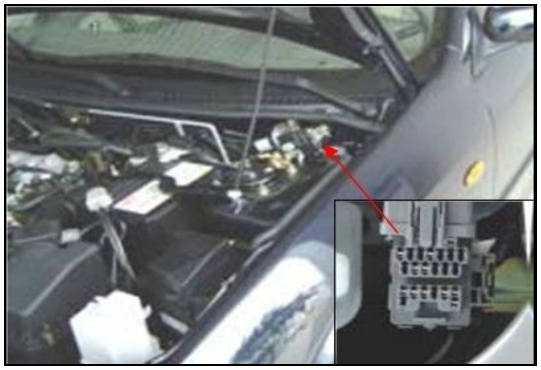


➢ VW Jetta（5 valve）behind fuse box of instrument ,16PIN. With [OBD II-16]connector

FAW

➢ XiaLi2000,beside absorber support. 17PIN,[TOYOTA-17F]connector.

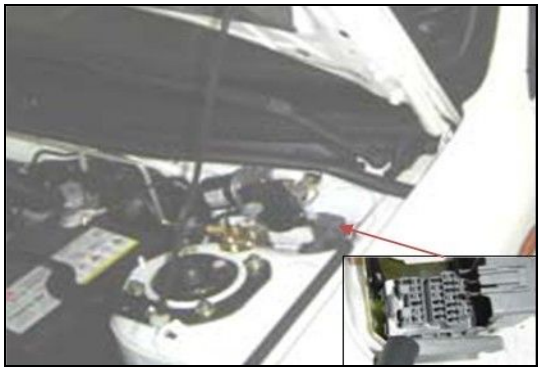
➢ TianJin Vios, under the dashboard，16PIN，With [OBD II-16]testing connector.



Mazda

- Mazda Familia, close to firewall on the left rear of engine compartment, 17PIN with [Mazda-17F] testing connector.

- Mazda Premacy, on the left front of engine compartment 17PIN, with [Mazda-17F] connector.



- Mazda 323, close to firewall behind the left of engine 17PIN,with [TOYOTA-17F] testing connector

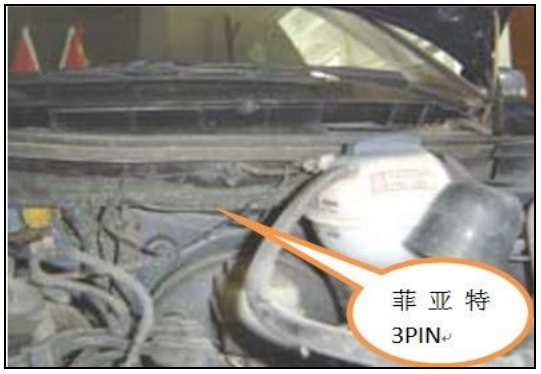
Peugeot Citroen Automobile

- Citroen Fukang 988, 2pin socket in relay box, the left of engine compartment【FUKang-2】connector

← Citroen Fukang 988, AT system diagnostic socket in fuse box under instrument, 16PIN [OBD II-16] testing connector

KIA

← KIA Qianlima, under the instrument, 16PIN with [OBD II-16] connector



CHERY Automobile

← SAIC CHERY,MM electronic control system diagnostic socket colse to firewall in engine compartment, 3PIN, with [Marelli-3] tesing connector

← SAIC CHERY,ABS diagnostic socket under intrument,16PIN,[OBD II-16]connector.

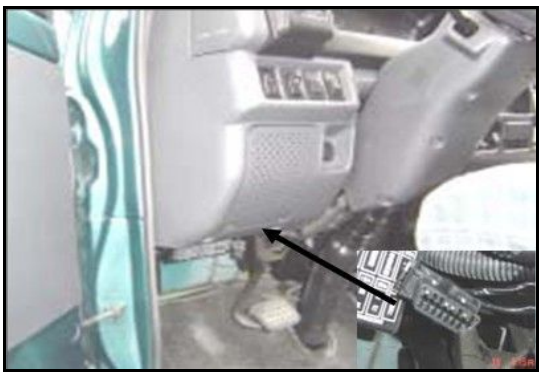
- SAIC,Motorola K2, electronic control system diagnostic socket close to firewall in engine compartment,16PIN, with[OBD II-16] testing connector。

Hyundai

- Hyundai Sonata, under the instrument, 16PIN, [OBD II-16] testing connector.

Southeast Automobile

- LIONCEL, close to steering post under the instrument, 16PIN [OBD II-16] testing connector.



- Southeast mimibus, under the instrument,16 PIN, select [OBD II-16] testing connector.

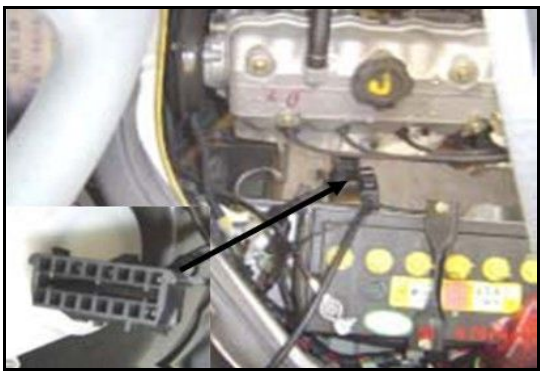
Brilliance China Auto

- Brilliance Auto.colse to steering post under the instrument,16PIN,select[OBD II-16] connector

Changan Auto

- Linyang, under the instrument,16PIN, select [OBD II-16] testing connector.

- Changan star, under the center console,16PIN, select [OBD II-16]testing connector.



- Changan Star, minibus, close to battery under engine cover,16PIN,[OBD II-16]connector.

FIAT

- Fiat Siena, in the fuse box under the instrument, 16PIN, select [OBD II-16] connector。

GEELY Auto

- GEELY MEIRI, under the left of instrument,16PIN,select[OBD II-16] connector.

CF LIEBAO

- CF LIEBAO, on the lower left of the instrument, 16PIN,select [MITSUBISHI-12+16] connector.

JINBEI

- JINBEI minibus, close to battery under engine cover,16PIN, with [OBD II-16]connector.

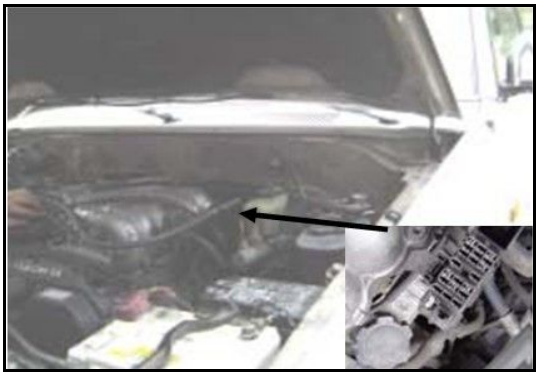
NISSAN Auto

- NISSAN Sunny, 2.0LS, 16PIN diagnostic socket close to steering post under instrument, select [OBD II-16] connector.

- CEFIRO,14PIN diagnostic socket in fuse box at the lower left of instrument [NISSAN-14] connector.

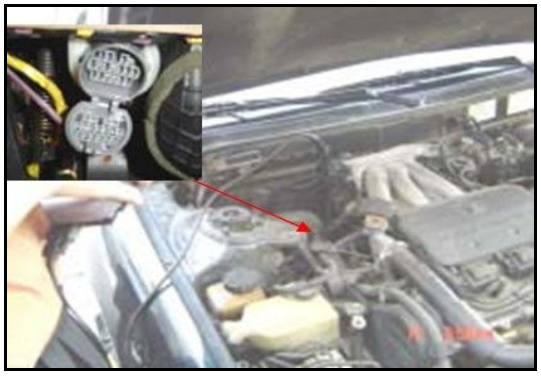
TOYOTA

- TOYOTA Previa,under the driver seat, 17PIN, select [TOYOTA-17] testing connector.



- Toyota Land Cruiser 3400, beside intake manifold, 17PIN, select[TOYOTA-17] testing connector.

- Toyota Camry 2.2, beside brake power steering pump,17PIN,select [TOYOTA-17] connector



- Toyota Lexus, the left side of engine compartment,17PIN, select[TOYOTA-17] connector

- Toyota Avalon has a total of three diagnostic sockets,17PIN semi-round beside firewall in engine compartment, select [TOYOTA-17] connector.

  Toyota Avalon, 17PIN, square diagnostic socket beside intake manifold, select [TOYOTA-17] connector

OPEL Auto

- OPEL Vectra, under the glove compartment cover of Cab, 16PIN, select[OBD II-16]connector

Benz

- Benz S320 140, under engine cover in the right side of engine compartment,
  Benz 560SEL 129, the right side of engine compartment,38PIN
  Benz 300SEL 140 Chassis, the right side of engine compartment, 38PIN,select[BENZ-38] testing connector

- The diagnostic socket of all the Benz series model manufactured after the year of 2001are located on the lower left of dashboard.

BMW Auto

- BMW 735i the left side of engine compartment, 20PIN,select[BMW-20] connector